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TECHNICAL REPORT M-69-1

VEGETATION STRUCTURAL CHARACTERISTICS AT SELECTED SITES IN THE PANAMA CANAL ZONE AND THAILAND

by

H. W. West



January 1969

Sponsored by

Joint Chiefs of Staff

Service Agency

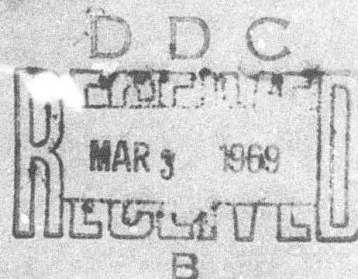
U. S. Army Materiel Command

Conducted by

U. S. Army Engineer Waterways Experiment Station
CORPS OF ENGINEERS

Vicksburg, Mississippi

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Program Manager for Selected Ammunition

Degradation Effects Program

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Vicksburg, Mississippi

ARMY-MRC VICKSBURG, MISS.

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FOREWORD

This study was sponsored by the Degradation Effects Program (DEP), formerly Joint Environmental Effects Program. Funds for the study were allocated to the U. S. Army Engineer Waterways Experiment Station (WES) by the Program Manager for Selected Ammunition, Picatinny Arsenal, Dover, New Jersey.

This report was prepared by Mr. H. W. West, Military Activities Section (MAS), Terrain Analysis Branch (TAB), Mobility and Environmental (M&E) Division, from data collected by WES field teams at DEP test sites in the Canal Zone (CZ) during September and October 1966, and at selected sites in Thailand during February to April 1965 in support of a research project sponsored by the Office, Secretary of Defense, Advanced Research Projects Agency. Computer programs for plotting the graphs and histograms and printing the data tabulations were developed by Miss J. A. Parks, MAS, and Mr. E. A. Baylot, Remote Sensing Section, TAB.

All phases of this study were under the direct supervision of Mr. R. R. Friesz, Chief, MAS, and under the general supervision of Mr. W. E. Grabau, Chief, TAB, and Messrs. W. G. Shockley and S. J. Knight, Chief and Assistant Chief, respectively, of the M&E Division.

The Directors of WES during the collection of data and preparation of this report were COL Alex G. Sutton, Jr., CE; COL John R. Oswalt, Jr., CE; and COL Levi A. Brown, CE. Technical Director was Mr. J. B. Tiffany.

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SUMMARY

A mission of the Degradation Effects Program (DEP), formerly Joint Environmental Effects Program (JEEP), is to extrapolate estimates of lethality and munition effectiveness in DEP test environments to Southeast Asian environments. If these extrapolations are to be reliable it is imperative that the environmental conditions of the test areas be similar to those of Southeast Asia. Accordingly, objective comparisons must be made of DEP test environments and Southeast Asian environments.

This report describes and compares some significant vegetation structural characteristics of two selected DEP test sites in the Piña and Balboa forests in the Panama Canal Zone (CZ) and four selected sites in two forests and two rubber plantations in Thailand. The vegetation structural characteristics considered herein include stem diameter, stem spacing, stem height, and number of stems. Detailed ground measurements were available from seven data collection points in the CZ and four data collection points in Thailand. Location maps, air and ground photographs, and the personal knowledge of the field survey personnel were used to provide a general description of each site. Site comparisons were made from an analysis of a series of graphs and histograms illustrating the number and cumulative number of stems and the spacing and cumulative spacing of stems included in each 1-cm-stem-diameter class and each 1-m-stem-height class.

Results of the study revealed the CZ and Thailand forests to be remarkably similar when comparing number of stems in each stem diameter class; however, when comparing spacing of stems in each diameter class and in each height class the forests were somewhat dissimilar. The larger trees in the CZ Piña forest and the two Thailand forests were generally of the same height and were taller than the trees in the CZ Balboa forest. The structural characteristics of the rubber plantations were very unlike those of the forests, which is to be expected.

The procedures used in sampling vegetation physiognomy are included as Appendix A. Computer print-outs of the vegetation data and the results obtained from manipulation of these data are included as Appendix B.

VEGETATION STRUCTURAL CHARACTERISTICS AT SELECTED SITES
IN THE PANAMA CANAL ZONE AND THAILAND

PART I: INTRODUCTION

Background

1. A mission of the Degradation Effects Program (DEP), formerly Joint Environmental Effects Program (JEEP), is to extrapolate estimates of lethality and munition effectiveness in DEP test environments to Southeast Asian environments. If these extrapolations are to be reliable, it is imperative that the environmental conditions of the test areas be similar to those of Southeast Asia. Accordingly, objective comparisons must be made of DEP test environments and Southeast Asian environments. This task is a function of the Environmental Characterization Working Group (ECWG), of which the U. S. Army Engineer Waterways Experiment Station (WES) is a member.

2. An inquiry to WES by the DEP Program Manager concerning the similarity between the Piña and Balboa forest sites in the Panama Canal Zone (CZ) precipitated a decision by WES to undertake an objective comparison of the vegetation characteristics of the two sites. Because no objective comparisons of DEP test environments and Southeast Asian environments had yet been made, a further decision was made to compare the CZ sites with selected sites in Thailand. The latter decision was based on the knowledge that detailed data were available on vegetation variations that occur in Thailand, and that, to quote Williams,¹ "The vegetation of Thailand, in general, is representative of the countries drained by the Mekong River and its tributaries." The results of these comparisons are included herein.

Purpose

3. The purpose of this report is to describe and compare some significant vegetation structural characteristics of two selected DEP sites in the CZ and four selected sites in Thailand.

Approach

4. The basic information for this report was obtained primarily from field surveys. Detailed ground measurements were available from seven data collection points* at two sites** in the CZ (fig. 1) and four data

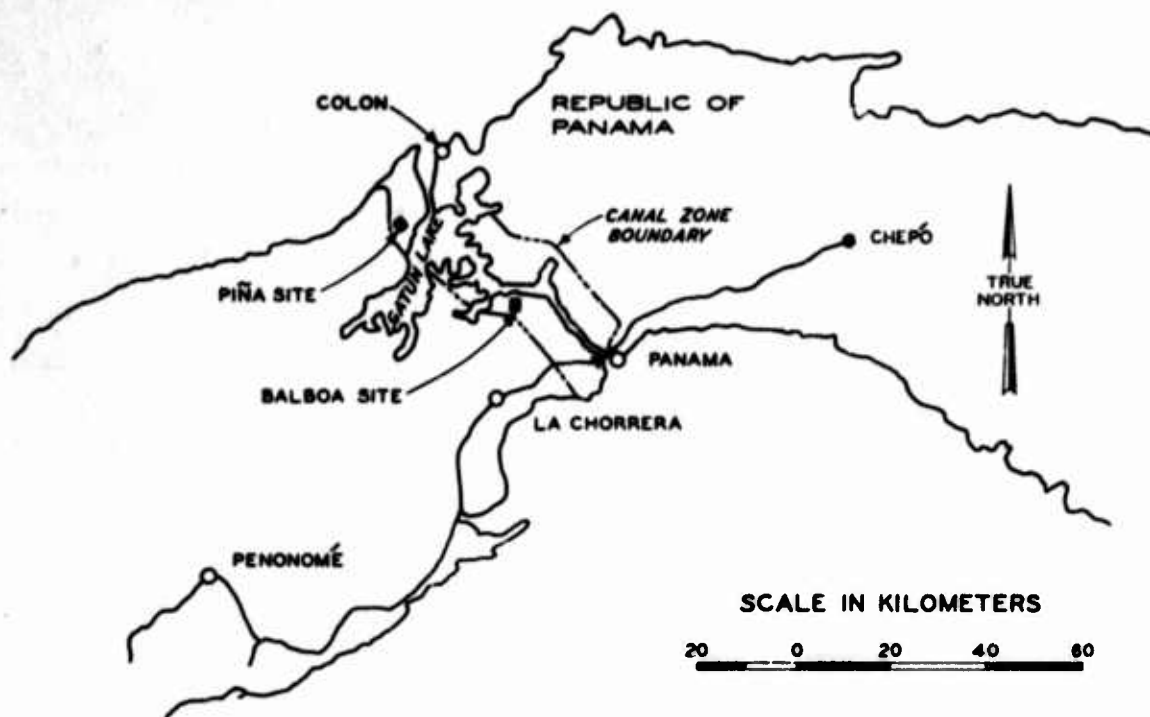


Fig. 1. Panama Canal Zone sites

collection points at four sites in Thailand (fig. 2). The CZ data were collected in support of DEP tests and special airdrop tests by the U. S. Air Force,² whereas the Thailand data were obtained in connection with another project.³ Location maps, air and ground photographs, and the personal knowledge of WES personnel were used to provide a general description of each site. Detailed site comparisons were made from an analysis of selected vegetation structural data plotted as histograms and graphs in

* The term "data collection point" in this report refers to a small circular sample area (usually less than 50m in diameter) in which the structural attributes of a vegetation assemblage were measured and recorded in the field.

** The term "site" in this report refers to a specific area under study, the boundaries of which encompass one or more data collection points.

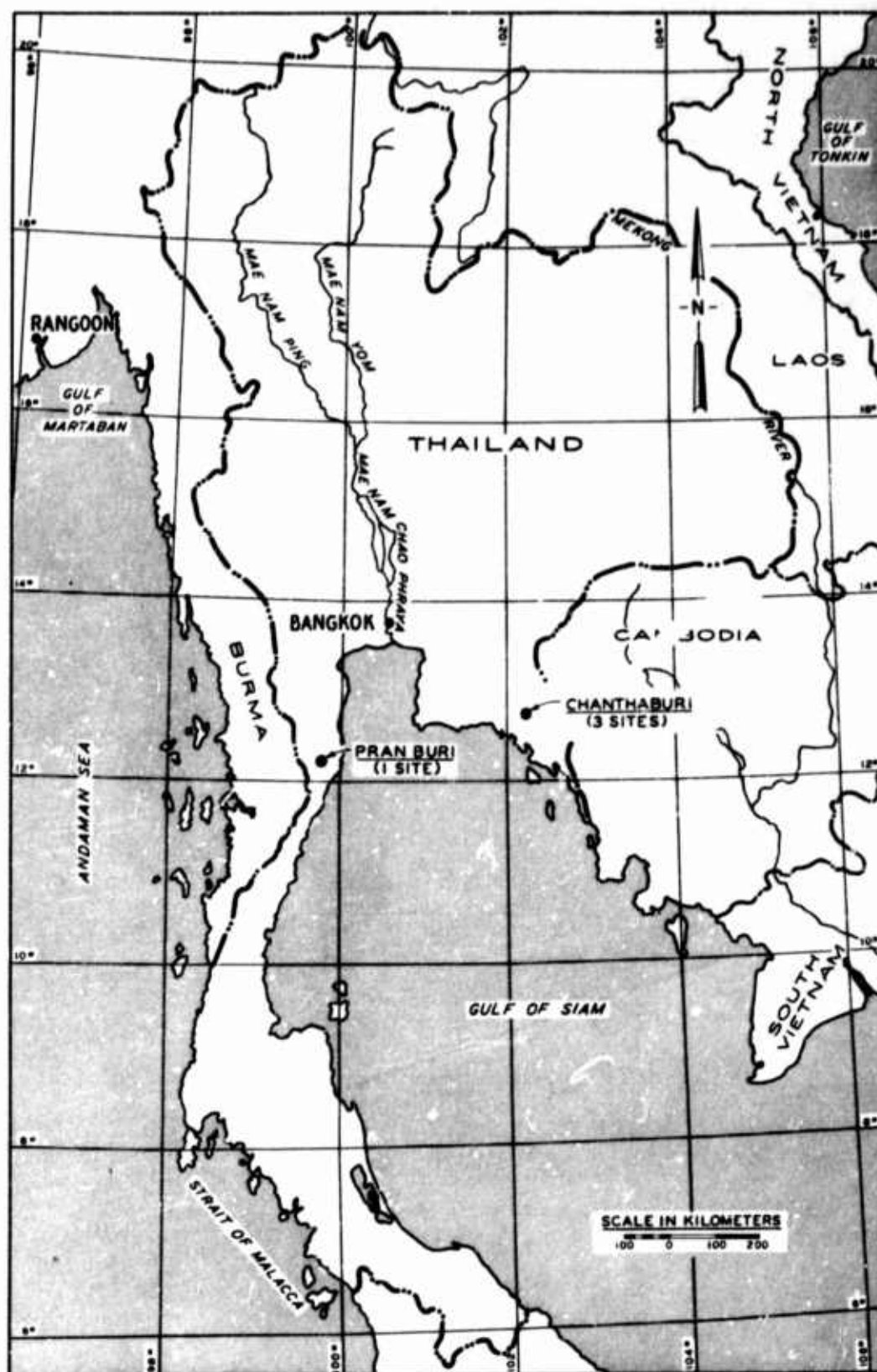


Fig. 2. Thailand sites

plates 1-8. Procedures for sampling vegetation physiognomy and the methods used for the reduction and presentation of data are discussed in Appendixes A and B, respectively. Also included in Appendix B are the computer print-outs of the vegetation structure data for each site and the results of computations that were used to construct the graphs and histograms.

PART II: LOCATION AND GENERAL DESCRIPTION OF SITES

5. General locations of the CZ and Thailand sites are shown in figs. 1 and 2, respectively. Specific locations and general descriptions of the selected sites are presented in the following paragraphs.

Canal Zone Sites

Piña forest (WES site P3)

6. This site, which is designated as being within the tropical rain forest zone,^{4,5} is in a forested area in the narrow stream valley of the Rio Providencia on the U. S. Air Force Piña Range approximately 25 km southwest of Colon, Panama (fig. 3). Relatively steep slopes (20 percent at two data collection points) are present throughout the site, although narrow floodplains, usually less than 100 m in width, are found occasionally along the Rio Providencia. The soils are very dark brown silty clay loams, classified as MH according to the Unified Soil Classification System (USCS). The site, which from the air appears to be typical of many tropical rain forests, consists of a relatively uniform, densely interwoven canopy through which a number of widely spaced, giant, individual ("emergent") trees are visible. The appearance of the site from the air is illustrated by the vertical air photograph in fig. 4. Plotted on the photograph is an outline of the site and the approximate centers of the data collection points (P3-01 through -04) at which detailed ground data were collected. From the ground within the forest a number of canopy openings are visible, and the canopy does not appear as uniform as it does from the air. Frequently on sunny days, shafts of sunlight pierce the canopy, often reaching the forest floor (figs. 5-8). The understory is quite dense and twigs and decaying leaves cover the forest floor; the appearance from the ground is illustrated by figs. 9-13. A description of vegetation found at data collection points P3-01 through -04 is given in Appendix B, tables B1-B4.

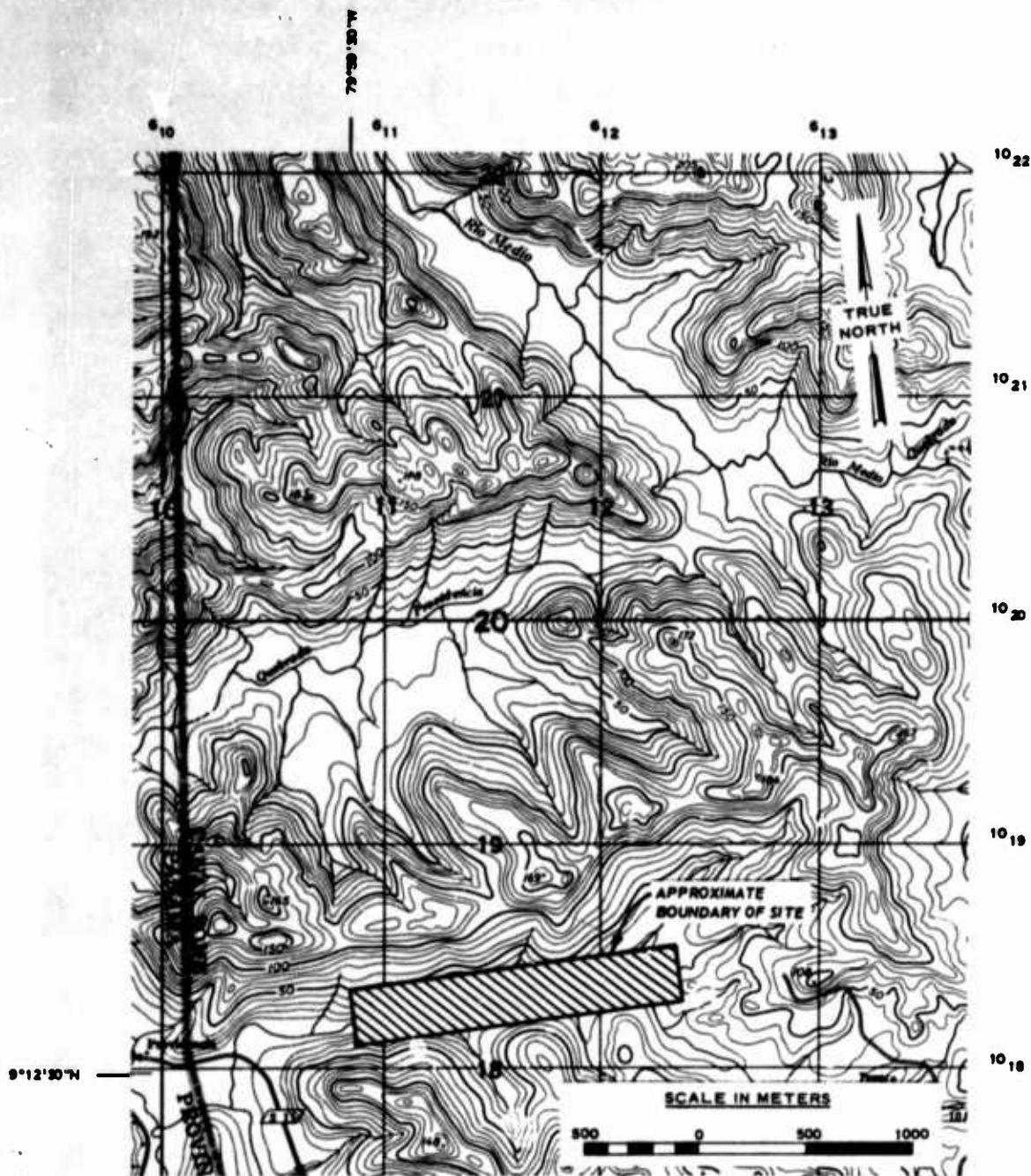


Fig. 3. Location of forest site, Piña Range, Panama Canal Zone

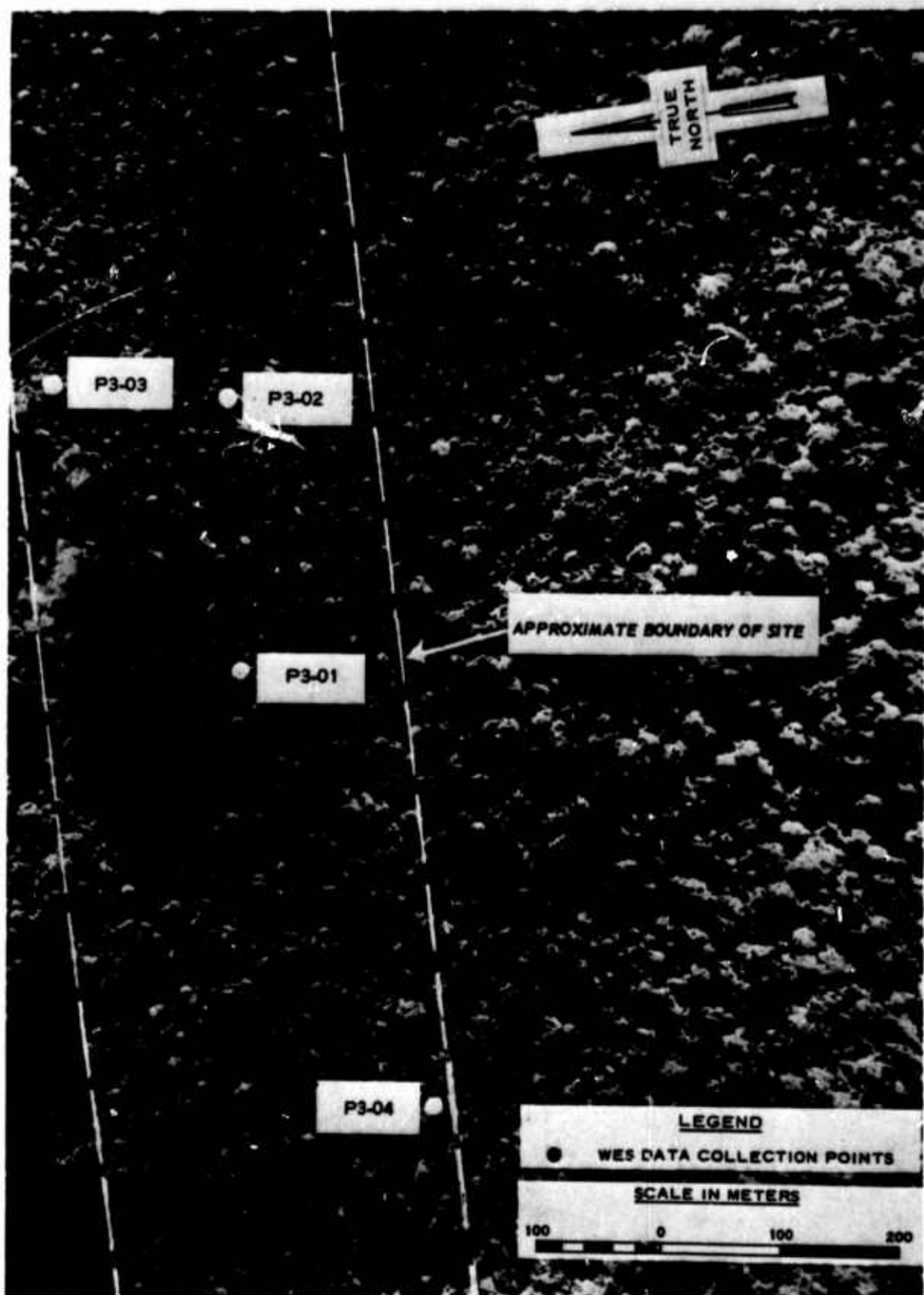


Fig. 4. Vertical air photo of forest site, Piña Range, Panama Canal Zone



Fig. 5. Canopy at data collection point P3-01. Note crown of palm tree in center of photograph (September 1966)



Fig. 6. Lower canopy at data collection point P3-01. Note large vines (September 1966)

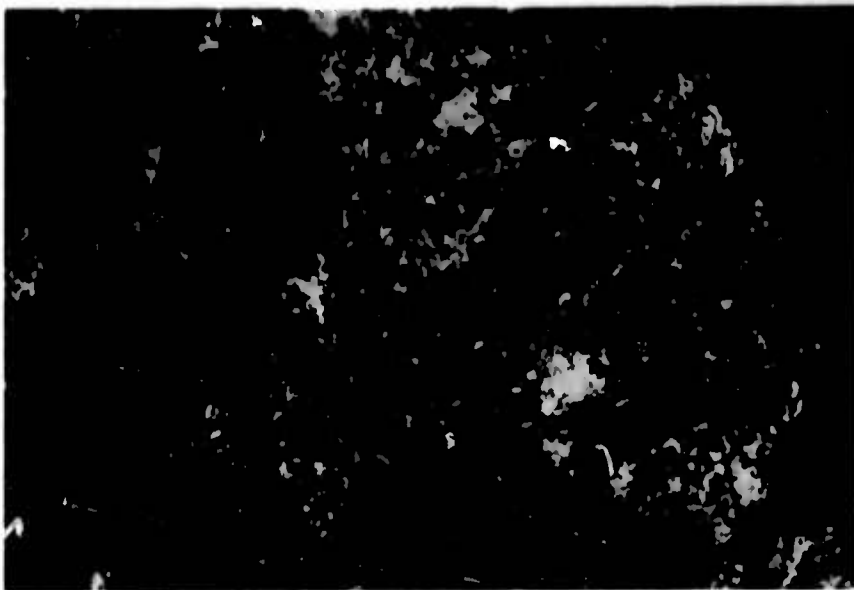


Fig. 7. Canopy at data collection point P3-02. Note large vines extending into the upper canopy (September 1966)



Fig. 8. Holes and gaps in canopy at data collection point P3-04 (September 1966)



Fig. 9. Stereopair showing the dense undergrowth vegetation at data collection point P3-01 (September 1966)

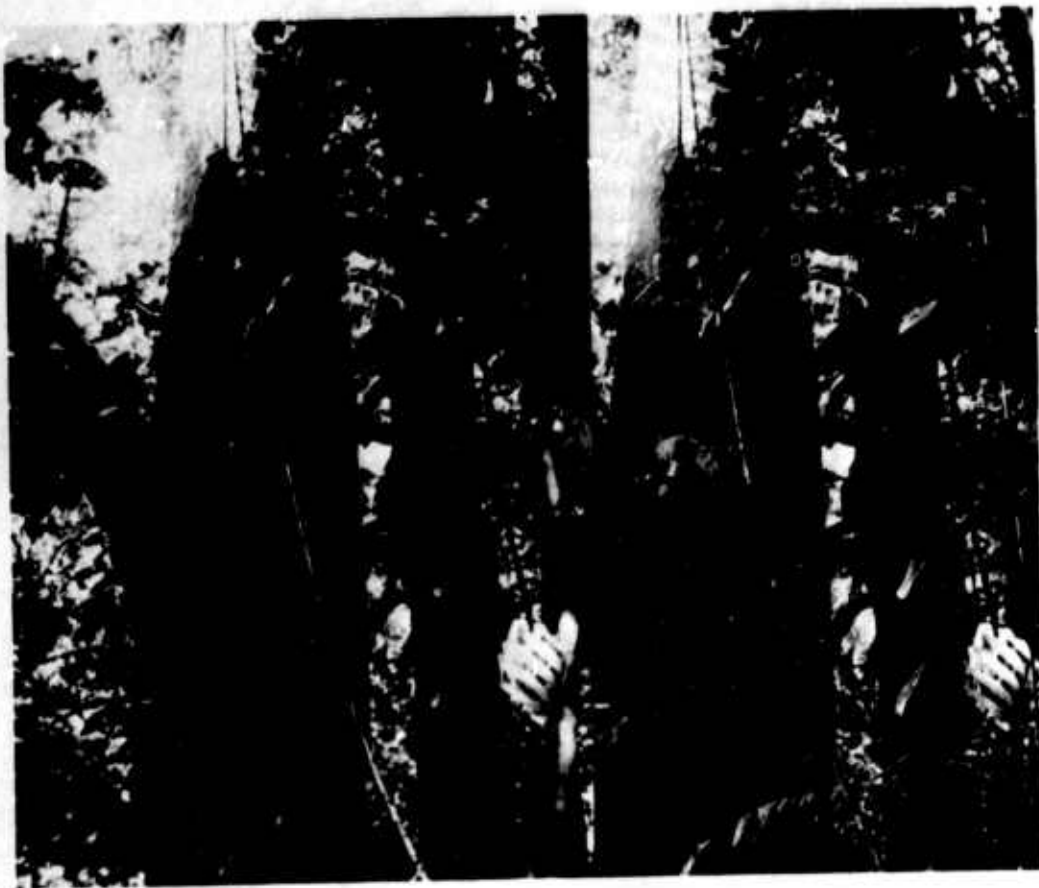


Fig. 10. Stereopair showing bole of large emergent tree near data collection point P3-02 (September 1966)



Fig. 11. Forest floor at data collection point P3-02
(September 1966)



Fig. 12. Stereopair showing bole of emergent tree
and large concentration of vines near data collec-
tion point P3-03 (September 1966)

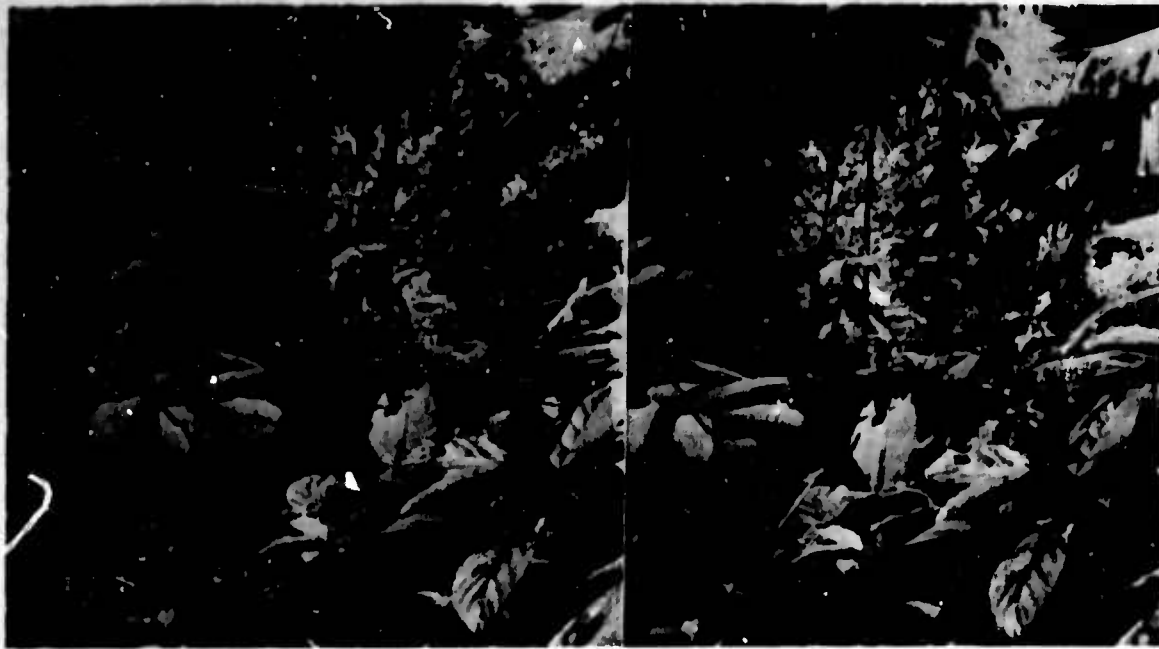


Fig. 13. Stereopair showing understory vegetation at data collection point P3-04 (September 1966)

Balboa forest (WES site P4)

7. This site, which is designated as being within the transition zone between tropical deciduous and tropical rain forest,⁵ is in a forested area on the U. S. Air Force Balboa Range approximately 25 km northwest of Panama City (fig. 14). The site is on a generally south-facing slope of approximately 15 percent, but there are several minor slope reversals (including a road embankment), causing the ground surface configuration to be quite irregular. The soils are predominantly brownish silt loams to clay loams (MH by USCS). From the air the appearance of the site is similar to that of many tropical forests of the world; the main canopy closure looks complete and the canopy appears to be uniform, although a number of widely spaced emergent trees can be seen extending above the main level of the canopy. The vertical air photograph in fig. 15 and the oblique air photograph in fig. 16 illustrate the appearance of the site from the air. The site limits are outlined in figs. 15 and 16; also shown in fig. 15 are the approximate locations of the data collection points P4-01, -06, and -07 at which detailed ground data were obtained (figs. 17-23). From the ground within the forest it is usually possible to see patches of sky through

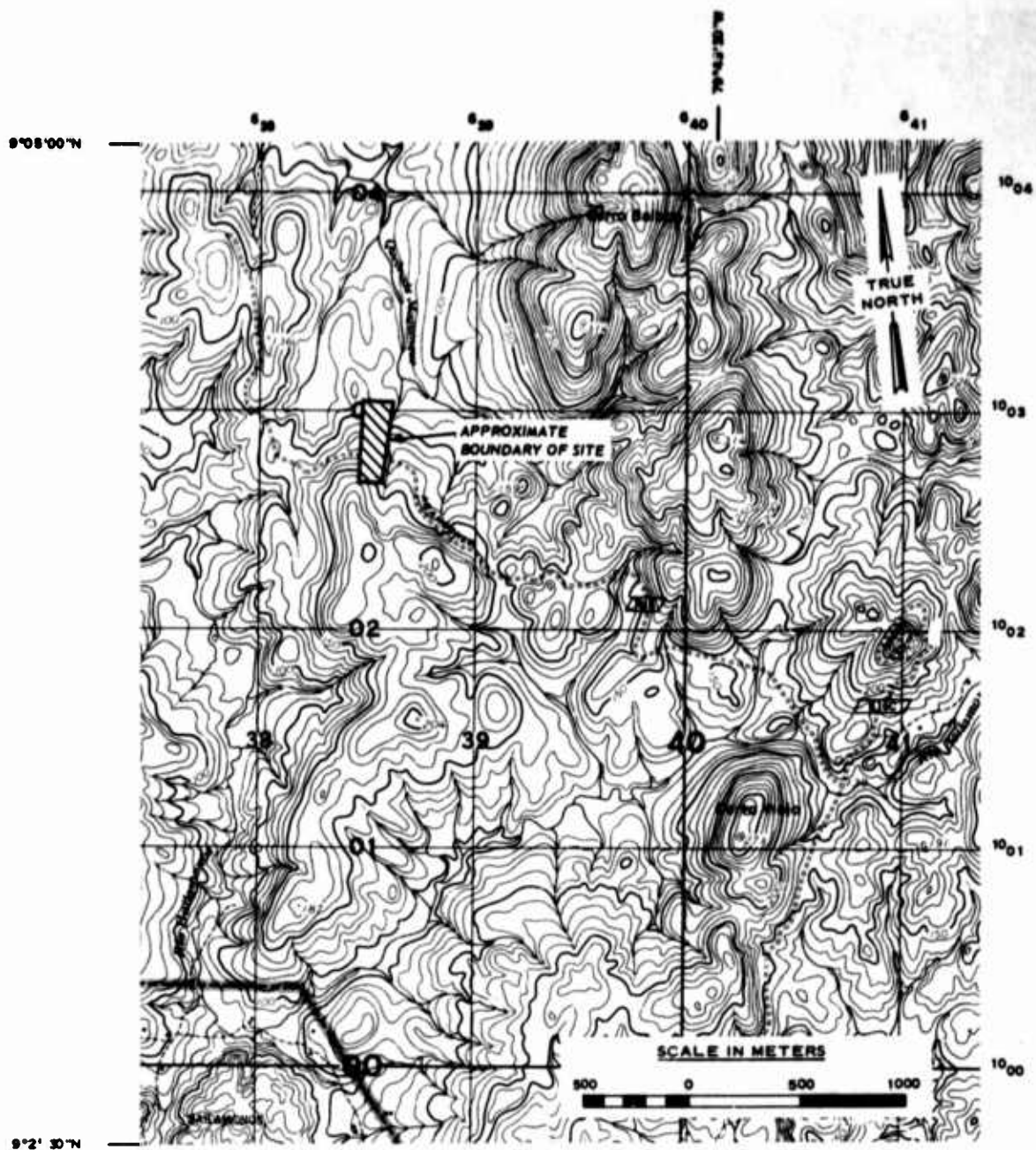


Fig. 14. Location of forest site, Balboa Range, Panama Canal Zone

holes and gaps in the canopy (figs. 20 and 21). The understory vegetation has a tendency to be more dense in the depressions than on the ridges and hillsides. Small loose stems and leaves litter the ground surface. Figs. 17, 18, 19, 22, and 23 illustrate the appearance of the forest floor. A description of vegetation found at data collection points P4-01, -06, and -07 is given in Appendix B, tables B5-B7, respectively.

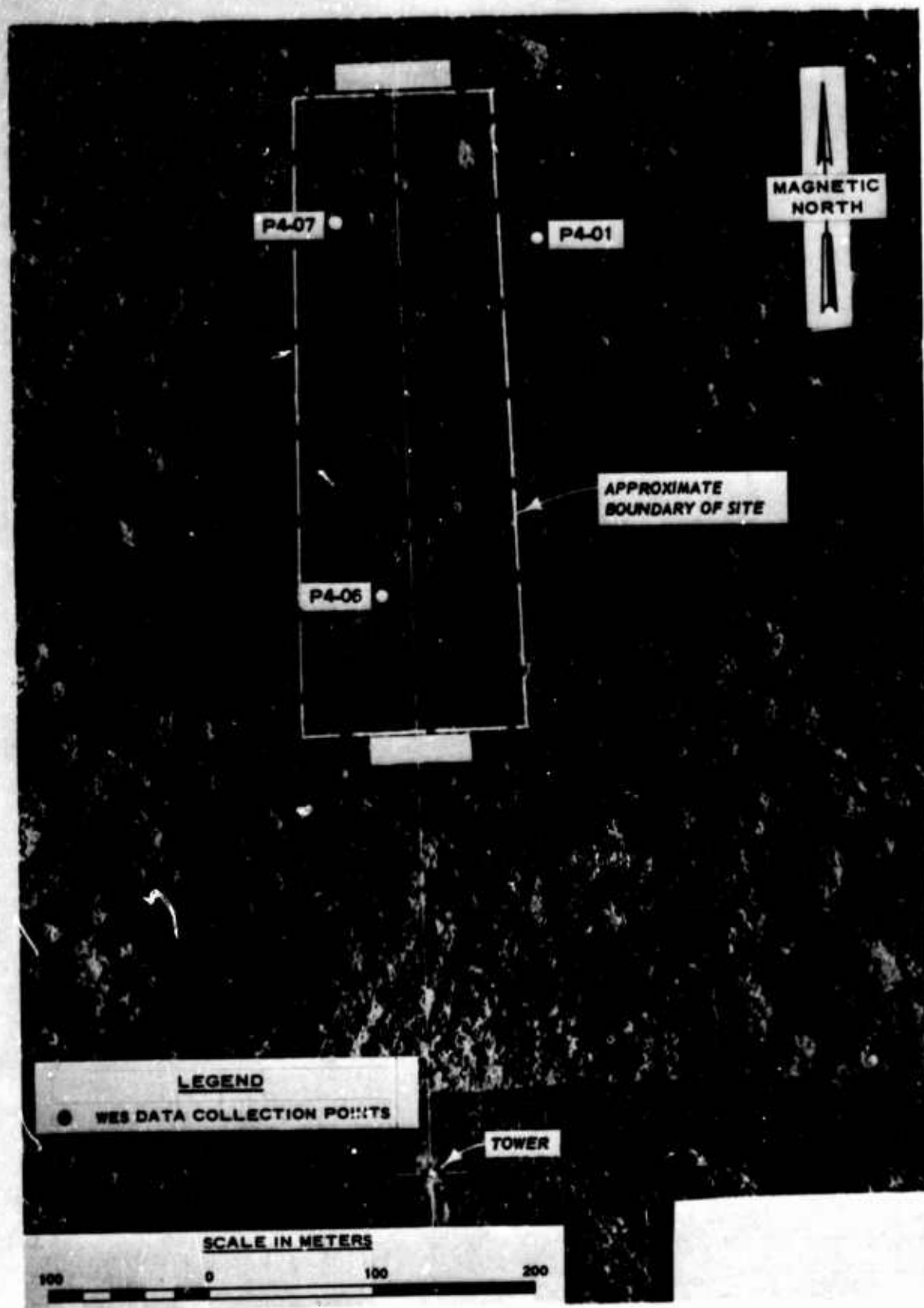


Fig. 15. Vertical air photo of forest site, Balboa Range, Panama Canal Zone

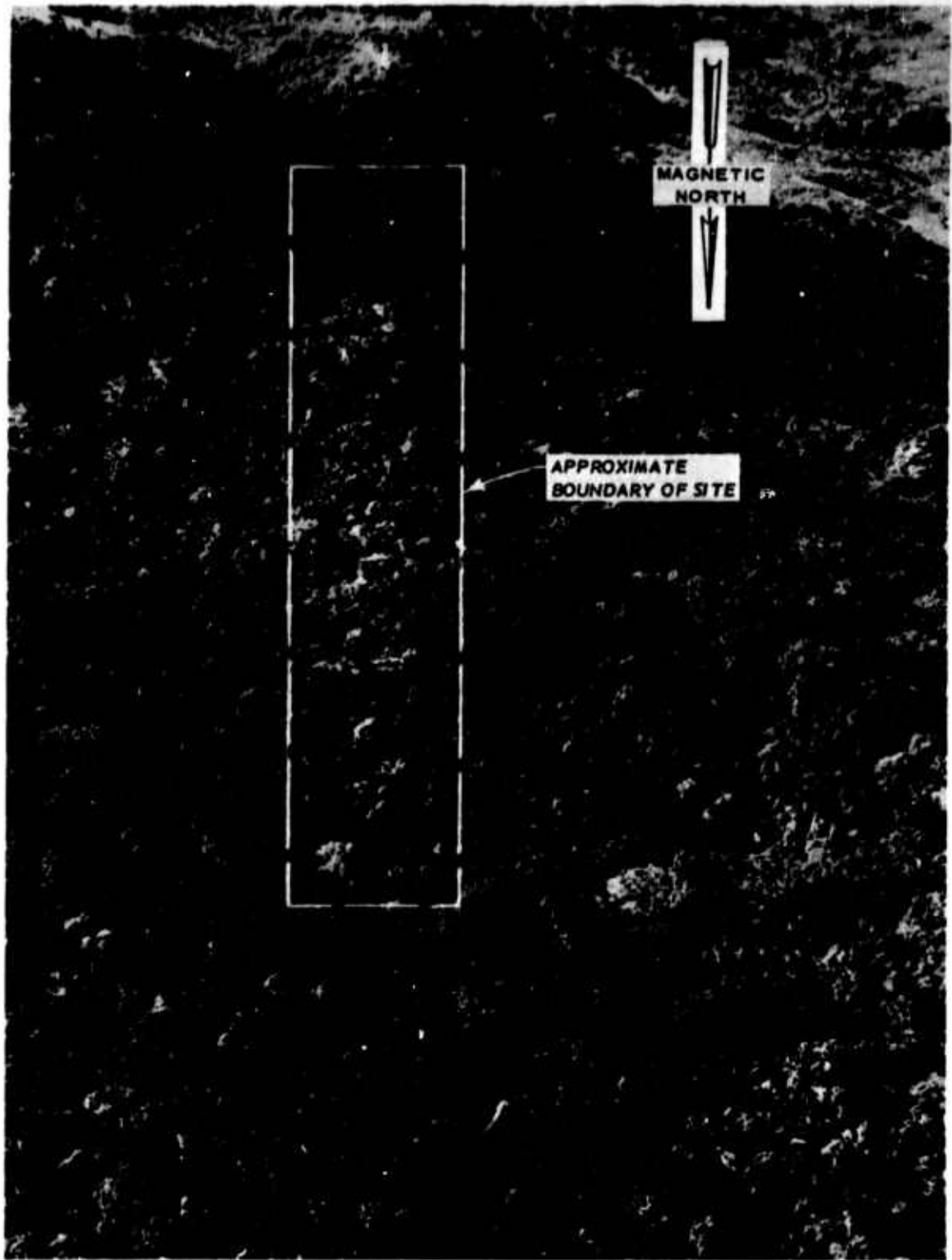


Fig. 16. Oblique air photo of Balboa Range Site,
Panama Canal Zone



Fig. 17. Looking north toward the center of data collection point P4-01 (September 1966)



Fig. 18. Large-stem trees and understory vegetation near data collection point P4-01 (September 1966)

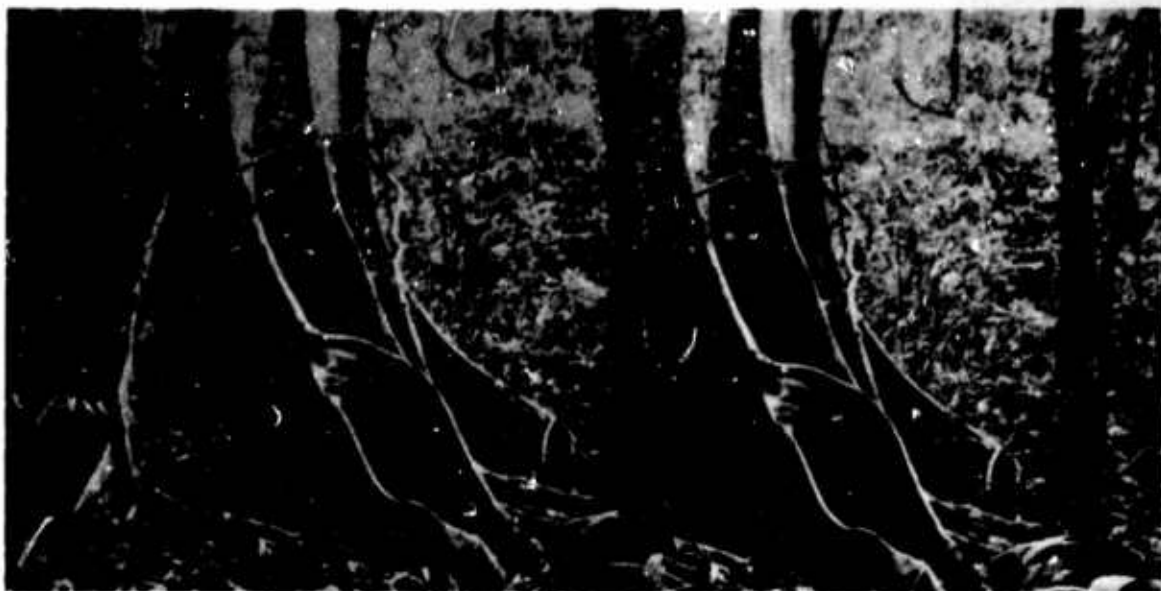


Fig. 19. Stereopair showing plank buttress of large tree at data collection point P4-01. Buttresses are 4 m high and have a 4-m spread (September 1966)



Fig. 20. Crown of the tree with large buttress shown in fig. 19 (September 1966)

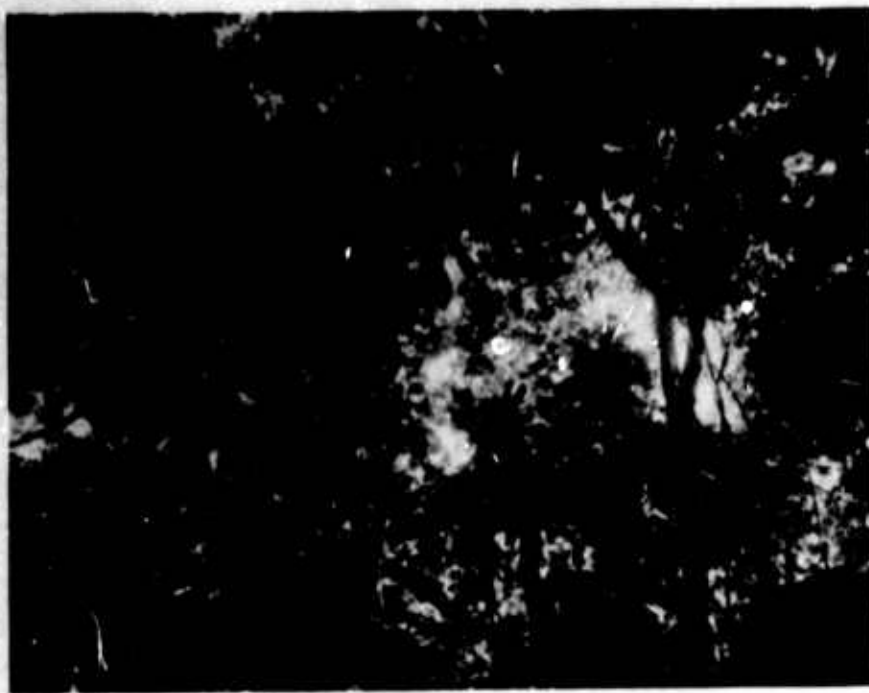


Fig. 21. Lower canopy at data collection point P4-01
(September 1966)

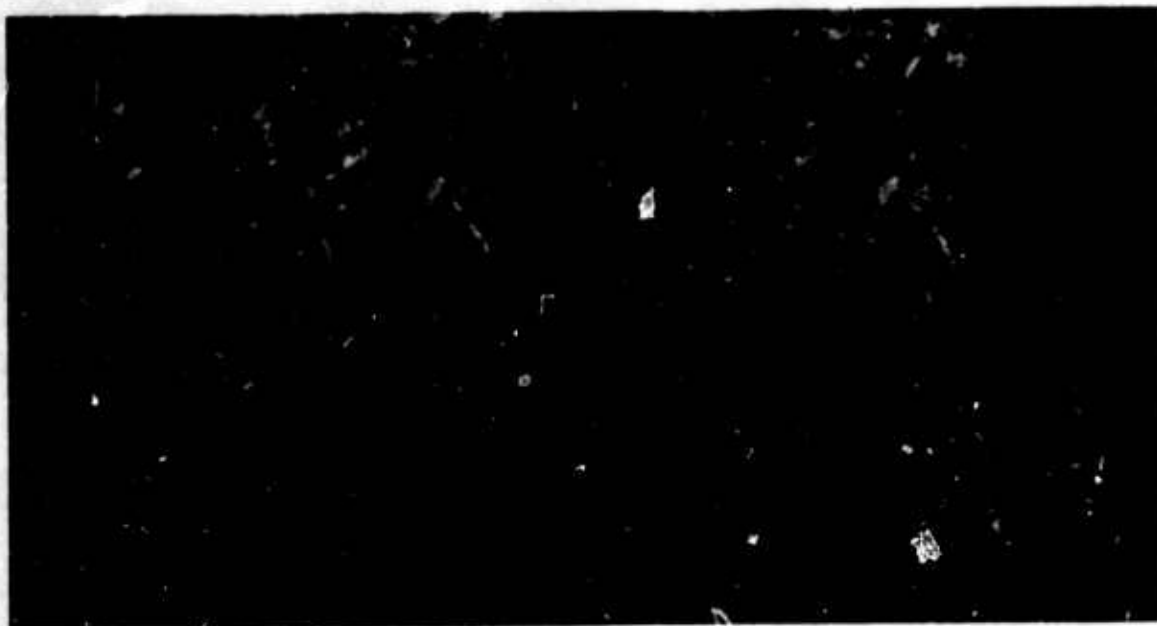


Fig. 22. Stereopair of forest floor near data collection
point P4-06 (September 1966)

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Fig. 23. Stereopair showing dense understory vegetation near data collection point P4-07 (September 1966)

Thailand Sites

Pran Buri forest (WES site V0458)

8. This site, which is designated as being within the tropical rain forest zone by Richards⁴ but within the deciduous mixed forest zone by Williams,¹ is in a forested area in the alluvial floodplain of the Mae Nam Pran Buri approximately 20 km northwest of Amphoe Pran Buri (fig. 24). The site is on a relatively flat terrace. The soils in the surface layer (approximately 35 cm in depth) are predominantly sandy loams (SM by USCS), and those in the subsurface layer are predominantly gravelly clay loams (GM by USCS). From the air (fig. 25) the top of the canopy appears to be relatively level, although crowns of tall trees are occasionally seen protruding through the main canopy level. The approximate location of the center of the data collection point V0458 and the outline of the site boundary are plotted in fig. 25. From the ground within the forest the canopy seems to be full of holes and gaps of various sizes that allow large shafts of sunlight to filter through to the forest floor. Numerous closely

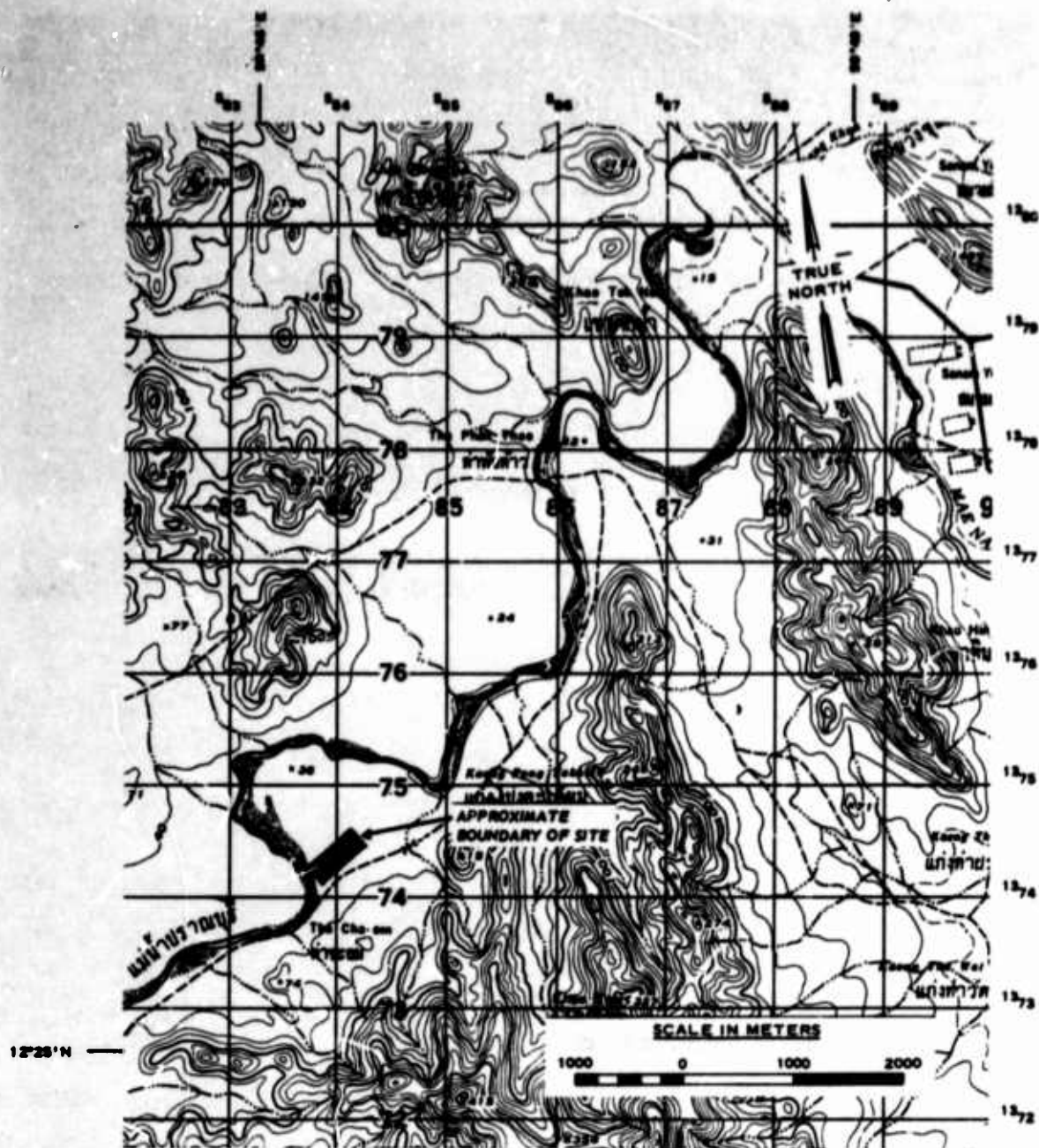


Fig. 24. Location of forest site, Pran Buri, Thailand

spaced small stems comprise a dense understory that varies in height up to the bottom of the main canopy. Fig. 26 shows the forest floor at this site. A description of vegetation found at data collection point VO458 is given in Appendix B, table B8.



Fig. 25. Vertical air photo of forest site, Pran Buri, Thailand

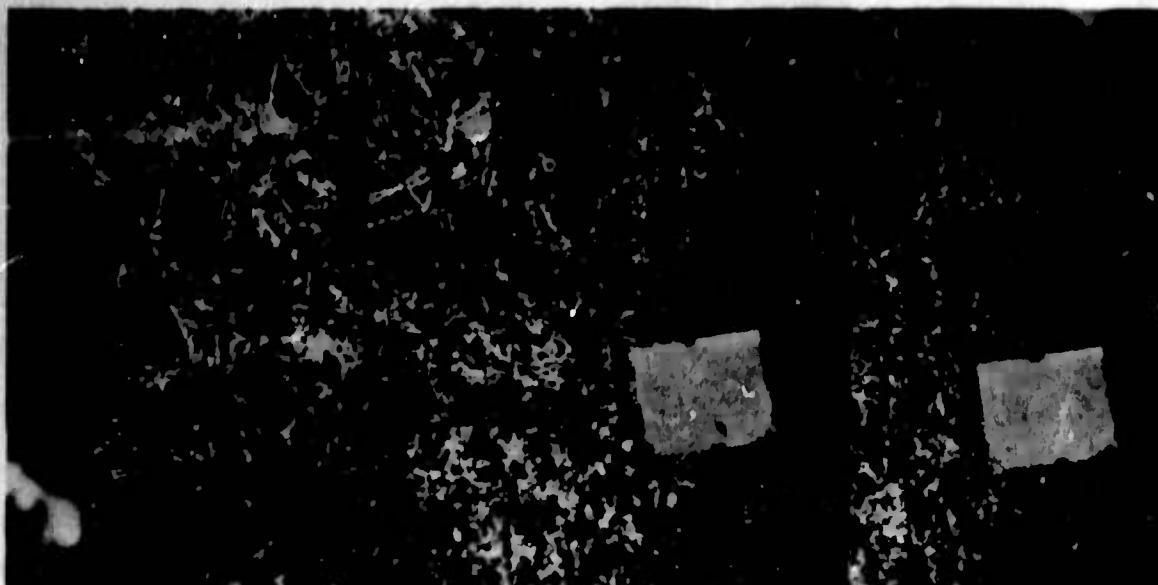


Fig. 26. Stereopair showing dense understory vegetation at data collection point V0458. Note sunlight hitting the forest floor (April 1965)

Chanthaburi rubber
plantation (WES site V0615)

9. This site is on a 22 percent ridge slope in a mature, well-kept rubber plantation approximately 15 km southeast of Chanthaburi (fig. 27). In this type of plantation the land is cleared before the rubber trees are planted and the plantation is then usually kept clear of underbrush. The surface soil (depth approximately 25 cm) is predominantly a sandy clay loam (SM by USCS) and the subsurface soil is a sandy loam (SM by USCS). From the air (fig. 28) the canopy seems to be quite uniform, especially when compared with that of the forested area that surrounds the plantation. Plotted on fig. 28 is an outline of the site and the approximate location of the center of data collection point V0615 at which detailed ground data were collected. From the ground within the rubber plantation the crowns of the trees seem to make a fairly well-defined stratum, although the maximum heights of individual trees may vary as much as 6 to 8 m. The understory of the plantation consists mostly of low shrubs and plants (less than 0.5 m in height). Fig. 29 is a ground photograph showing the site and the edge

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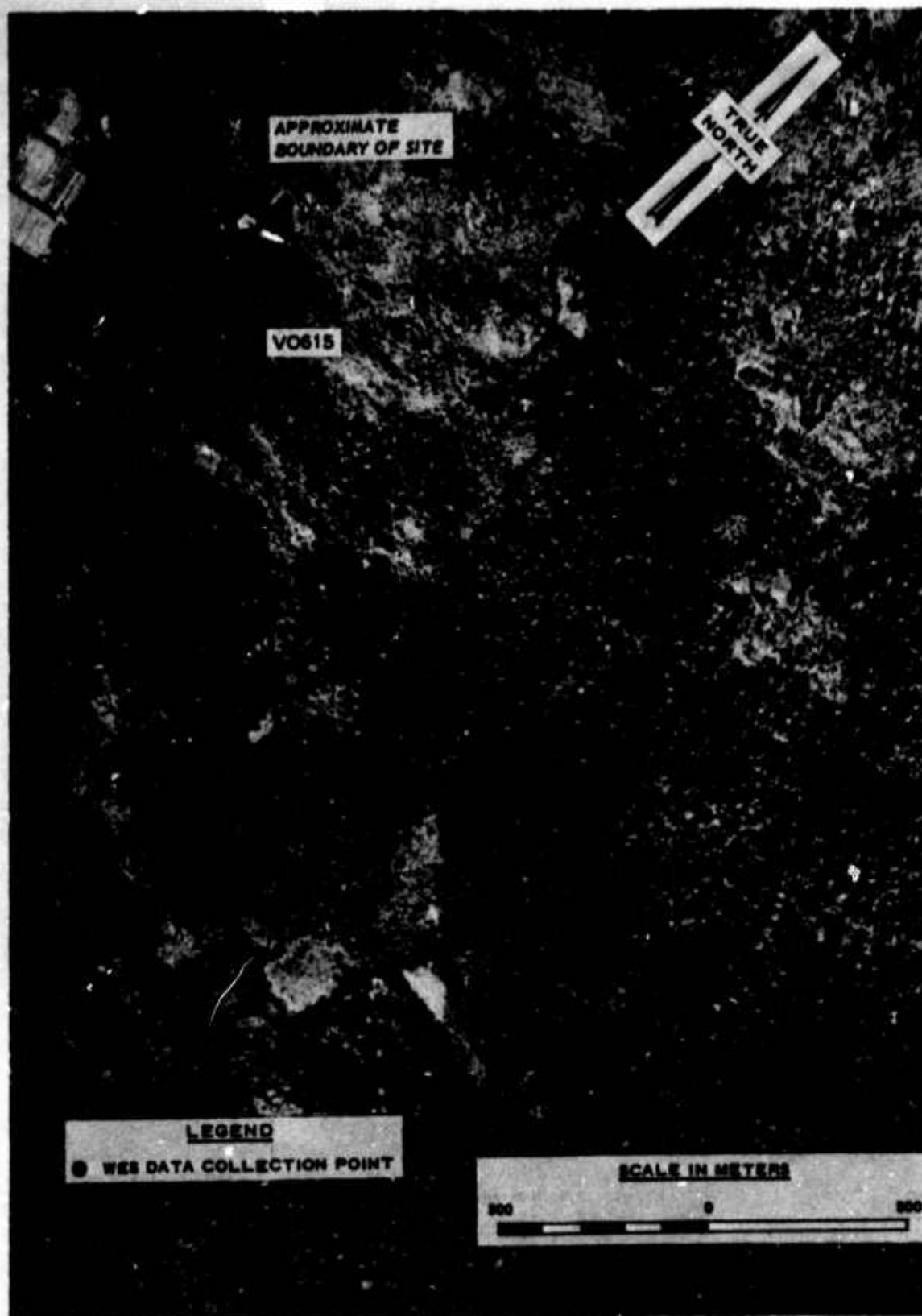


Fig. 28. Rubber plantation site, Chanthaburi, Thailand



Fig. 29. Stereopair of the plantation floor at data collection point V0615 (February 1965)

Chanthaburi forest (WES site V0640)

10. This site, which is within the tropical rain forest zone,¹ is in a small forest in a predominantly agricultural area approximately 16 km northwest of Chanthaburi (fig. 30). The site is near the top of a ridge at the head of a normally dry drainage channel on slopes of about 4 percent. The soils are predominantly loam (ML by USCS) in the surface layer (depth approximately 35 cm) and gravelly clay loam (CL by USCS) in the subsurface layer. From the air the canopy appears to be somewhat uniform, but gaps can be observed. Fig. 31 illustrates the appearance of the site from the air and shows the approximate location of the center of data collection point V0640 where detailed ground data were obtained. From the ground the crowns of the trees that form the main canopy level appear somewhat widely spaced. The understory vegetation is quite dense, and no well-marked stratum beneath the main canopy level is apparent. Photographs illustrating the appearance of the forest floor are shown in figs. 32 and 33. A description of vegetation found at data collection point V0640 is given in Appendix B, table B11.



Fig. 30. Location of forest and rubber and pineapple plantation sites, Chanthaburi, Thailand

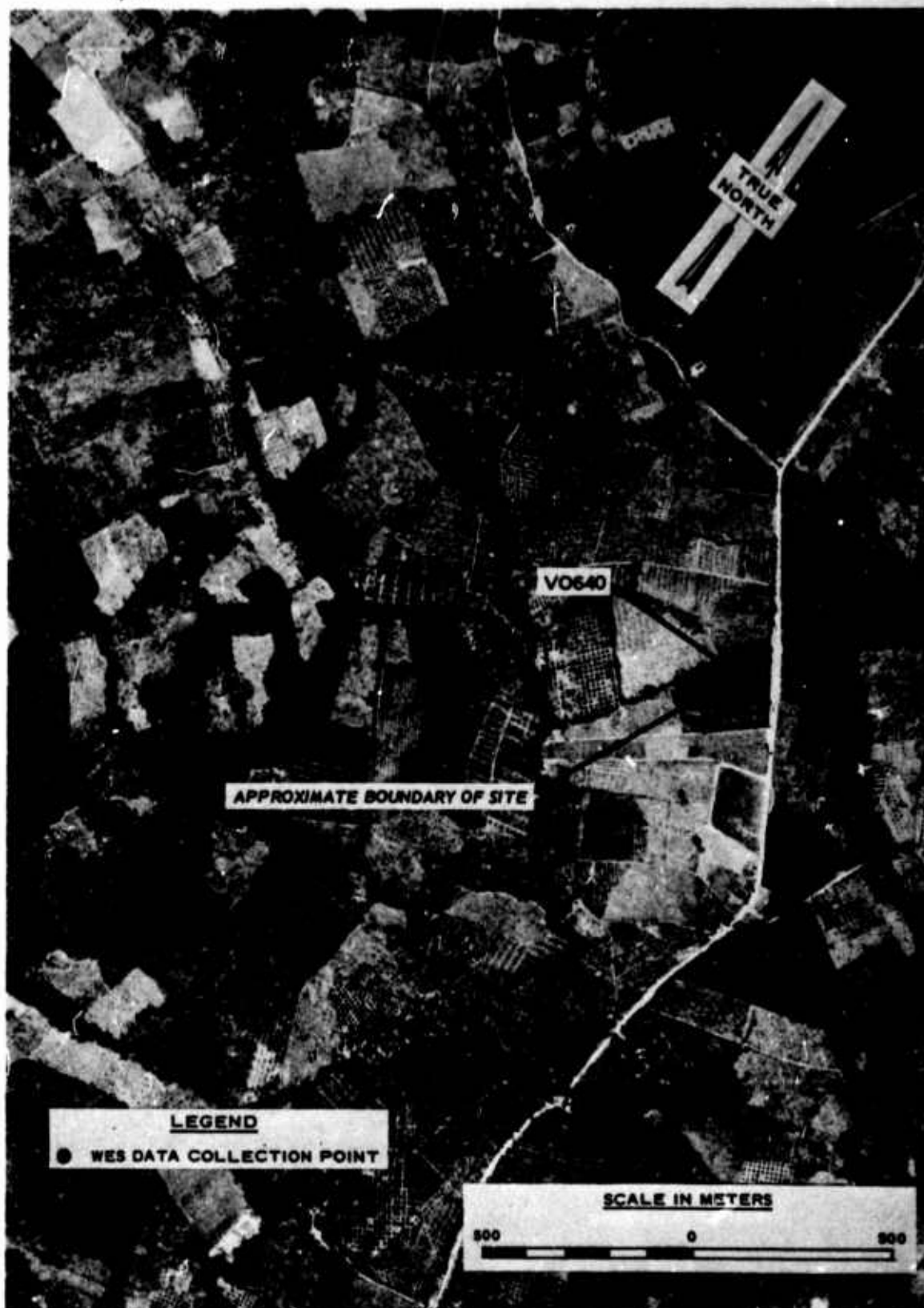


Fig. 31. Vertical air photo of forest site, Chanthaburi, Thailand

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Fig. 32. Dense understory vegetation at data collection point V0640 (March 1965)



Fig. 33. Stereopair showing dense understory vegetation at data collection point V0640

Chanthaburi rubber and pineapple plantation (WES site V0639)

11. This site is in a poorly kept rubber and pineapple plantation approximately 12 km northwest of Chanthaburi (fig. 30). In this type of plantation, the land is not completely cleared of the old rubber trees (slash) from the previous crop before another generation is allowed to grow undisturbed, thereby producing a somewhat dense understory. The site is on an east-to-west slope of approximately 4 percent. The soil in the surface layer (depth approximately 25 cm) as well as that in the subsurface layer is a sandy loam (SM by USCS). From the air the site appears to be a relatively young plantation. From the ground it is apparent that the canopy is not complete. Fig. 34, a ground photograph of the site, illustrates the understory (pineapple plants, etc.) and the amount of sunlight penetrating the canopy to the plantation floor. An aerial view of the site is shown in fig. 35; plotted therein are the outline of the site and the approximate location of the center of data collection point V0639. A description of vegetation found at this point is given in Appendix B, table B10.



Fig. 34. Stereopair of the plantation floor at data collection point V0639. Note pineapple plants and other understory vegetation (March 1965)

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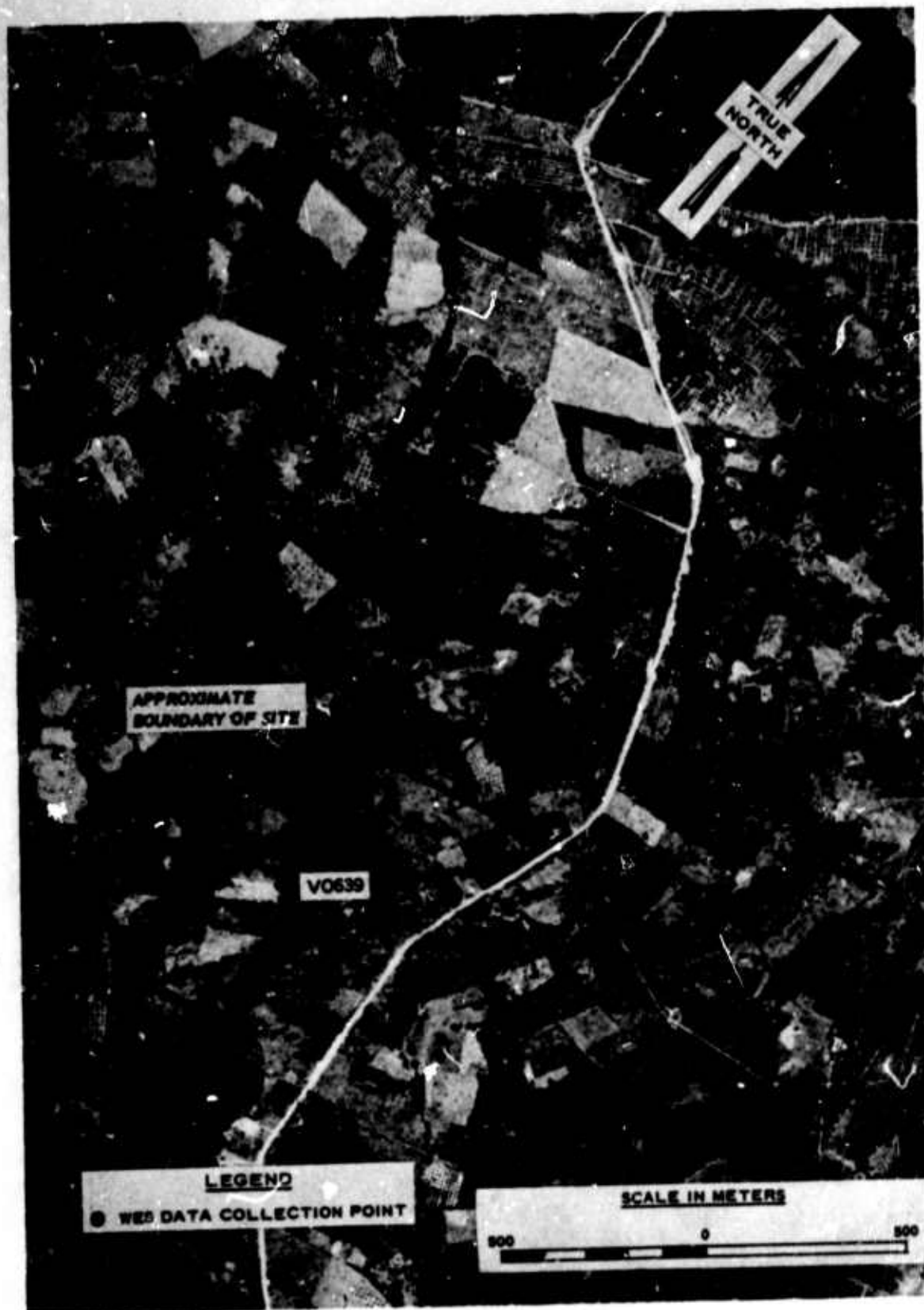


Fig. 35. Vertical air photo of rubber and pineapple plantation site, Chanthaburi, Thailand

PART III: COMPARISON OF VEGETATION STRUCTURE CHARACTERISTICS

12. In this study comparisons were made of stem diameter, stem spacing, stem height, and number of stems. Although these are by no means the only vegetation factors that affect the performance of munitions, they appear to be among the most significant. The number, size, and spacing of the stems control the free-flight path of projectiles; and the stem heights influence the distance aboveground at which fuses activate.

13. To provide an expedient means of making objective site comparisons two computer programs were developed to plot automatically a series of graphs and histograms that illustrate similarities and dissimilarities among the selected characteristics. One program computes the number and cumulative number of stems and the spacing and cumulative spacing of stems in 1-cm-stem-diameter classes, and the other program computes the number and cumulative number of stems and the spacing and cumulative spacing of stems in 1-m-height classes. In order for the environmental factors of one data collection point to be compared with those of another, all data collection points were placed on a common unit area (1257 sq m) that was equal to the area representing the largest structural cell that was measured. (For the procedures used see Appendix B.) Plates 1-8 present the various histograms and graphs that were produced for the CZ and Thailand site comparisons. Computer print-outs showing the computations used in constructing these histograms and graphs are also included as tables B12-B22 in Appendix B.

14. In the following paragraphs, only the general and most significant structural likenesses and differences among the study sites are discussed. Detailed comparisons among the CZ and Thailand data collection points can easily be made by an analysis of the graphs and histograms.

Number of Stems in Each Stem Diameter Class

15. Histograms representing the number of stems in each 1-cm-stem-diameter class for the CZ and Thailand sites are shown in plate 1. It is apparent that for most of the histograms the number of stems decreases

rapidly with increasing stem diameter to less than 10 stems somewhere in the 1- to 21-cm-stem-diameter class, then remains fairly constant at only a few stems for the remaining diameter classes. Obvious exceptions to this trend are found in three Thailand sites where (a) a significant increase occurs in the number of stems for stem diameter classes 8, 10-16, and 20 cm for the Pran Buri forest (fig. 4, plate 1); (b) a significant lack of stems in the 2- to 12-cm-stem-diameter class is noted for the Chanthaburi rubber plantation (fig. 5, plate 1); and (c) almost all of the stems in the Chanthaburi rubber and pineapple plantation (fig. 6, plate 1) are grouped in stem diameter classes of 1-9 and 15-20 cm. Other readily discernible dissimilarities are the nonexistence of any stems in the 26- to 46-cm-stem-diameter class for data collection point P4-06 (fig. 2b, plate 1) in the Balboa forest and the 23- to 57-cm-stem-diameter class for the Chanthaburi rubber and pineapple plantation (fig. 6, plate 1).

16. A point worthy of note is the absence of stems with large diameters at data collection point P4-01 (fig. 2a, plate 1) in the Balboa forest. This is partly attributed to the exclusion of the widely spaced emergent trees (trees with heights greater than 35 m) from the structural comparison (for an explanation of this see paragraph 6, Appendix B). Also, data collection point P3-01 in the PiMa forest would show a larger concentration of stems for diameter class 58 had not the emergent trees been excluded.

Cumulative Number of Stems of a Given Stem Diameter Class

17. Graphs illustrating the cumulative number of stems of a given stem diameter class and less (line A) and a given stem diameter class and greater (line B) for the sites are shown in plate 2. All of the forest sites exhibit similar characteristics; however, the curves for the Chanthaburi plantation sites (figs. 5 and 6, plate 2) are not only different from those of the forest sites but are dissimilar to each other. The two Chanthaburi plantation sites exhibit more stems than any of the forest sites. It will be noted that the Chanthaburi rubber and pineapple plantation has in excess of 250,000 stems, while the Chanthaburi rubber plantation

contains almost 50,000 stems; both sites show 99 percent of the stems occurring in stem diameter class 1. All of the sample points in the forest sites show a range of between 5000 and slightly more than 10,000 stems with approximately 80 percent of the stems occurring in stem diameter class 1.

Spacing of Stems in Each Stem Diameter Class

18. Plate 3 portrays spacing of stems in each 1-cm-stem-diameter class for the various study sites. The histograms, in general, show a gradual increase in stem spacing with increasing stem diameter, up to a diameter class of approximately 13-17 cm. Notable deviations from this trend are the poorly kept rubber and pineapple plantation (fig. 6, plate 3) where a maximum spacing is reached at a stem diameter class of 7 cm, the well-kept rubber plantation (fig. 5, plate 3), which shows a close spacing of understory plants, and the Pran Buri forest (fig. 4, plate 3) where a maximum spacing is attained at a stem diameter class of 3 cm. The greatest maximum spacing (40 m) is portrayed by the Chanthaburi forest (fig. 3, plate 3), and the least maximum spacing (20 m) is portrayed by the Pran Buri forest (fig. 4, plate 3). All other sites have maximum spacing ranging from 23 to 30 m, although one data collection point, P4-01 (fig. 2a, plate 3), in the Balboa forest site also shows a maximum stem spacing of 20 m.

19. Perhaps the most striking variation revealed by the histograms is the sudden decrease in stem spacing for most stem diameter classes between 8 and 21 cm in the Pran Buri forest (fig. 4, plate 3) and between 15 and 19 cm in the Chanthaburi rubber and pineapple plantation (fig. 6, plate 3). The close spacing in the 8- to 21-cm-stem-diameter range in the Pran Buri forest can be attributed to the fact that many of the plants within those stem diameter classes have multiple stems. Since the graphs are based on the number of stems rather than the number of plants, the result is a concentration of stems in the 8- to 21-cm-stem-diameter classes. The relatively close spacing in the 15- to 19-cm-stem-diameter class in the Chanthaburi rubber and pineapple plantation was brought about by the ordered planting of the rubber trees.

20. Another apparent anomaly worthy of discussion is the decrease in spacing for stem diameter class 58 in a number of the histograms. This feature is a product of the stem diameter computer program and is discussed in paragraph 5, Appendix B. Also it is notable that data collection point P4-01 (fig. 2a, plate 3) in the Balboa forest shows no spacing values for stem diameters greater than 45 cm. Here, the absence of stems can be attributed to the exclusion of the emergent trees from the structural comparison (see paragraph 6, Appendix B).

Cumulative Spacing of Stems of a Given Stem Diameter Class

21. Graphs representing the cumulative spacing of stems of a given stem diameter class and less (line A) and of a given stem diameter class and greater (line B) are contained in plate 4. Since the curves depicting cumulative spacing of a given diameter class and less are nearly straight lines extending almost horizontally across the graph they are irrelevant in this case. However, the curves for cumulative spacing of stems of a given stem diameter class and greater portray some predominant variations if only the 35- to 58-cm-stem-diameter classes are considered. Sharp increases in cumulative spacing take place in these diameter classes in the Chanthaburi rubber plantation (fig. 5, plate 4), and the Chanthaburi forest (fig. 3, plate 4). The four Piña data collection points (figs. 1a-1d, plate 4) are remarkably similar while the variation among the three Balboa data collection points (figs. 2a-2c, plate 4) is somewhat greater. It should be noted that the Pran Buri forest (fig. 4, plate 4) displays a much smaller spacing value in the low stem diameter classes than any of the other sites. The Chanthaburi rubber and pineapple plantation (fig. 6, plate 4) clearly displays the "stepped" spacing that would be expected in an artificially planted and maintained stand; it is perhaps worthy of note that the Chanthaburi rubber plantation (fig. 5, plate 4) displays this feature less clearly, probably because of the practice of replacing the old nonproductive trees with new trees.

Number of Stems in Each Height Class

22. Histograms portraying the number of stems in each 1-m height class are presented in plate 5. It is readily discernible that the number of stems generally decreases exponentially with increasing height. The most obvious exceptions to this trend, however, occur in fig. 4, plate 5 (Pran Buri forest), fig. 5, plate 5 (Chanthaburi rubber plantation), and fig. 6, plate 5 (Chanthaburi rubber and pineapple plantation). The concentration of stems in the 8- to 12-m height classes in fig. 4, plate 5, is attributable to the tendency for plants in those height classes to have multiple stems. In fig. 5, plate 5, the 0- to 1-m height class represents a dense ground cover of small, long-leaf plants, whereas the 14- to 23-m height classes contain the planted rubber trees. Grass, pineapple plants, and rubber trees comprise the 0- to 1-, 1- to 2-, and 10- to 12-m height classes, respectively, in fig. 6, plate 5.

23. When comparing the heights of the taller trees in the forest sites the Chanthaburi (fig. 3, plate 5), the Pran Buri (fig. 4, plate 5), and Piña forests (fig. 1, plate 5) showed heights in the 30- to 33-m range, whereas the Balboa forest (fig. 2, plate 5) exhibited heights in the 25- to 28-m range. The heights of the taller trees in the rubber plantation sites occurred in the 12- to 23-m range.

Cumulative Number of Stems of a Given Height Class

24. Graphs of cumulative number of stems of a given height class and less (line A) and of a given height class and greater (line B) are shown in plate 6. Except for the Chanthaburi plantations (figs. 5 and 6, plate 6), the general appearances of the graphs are very much alike. The differences portrayed by line B for the plantation sites (figs. 5 and 6, plate 6) are due to the existence of a large number of stems for the smallest height class and the occurrence of no stems in the 1- to 13-m and 2- to 9-m height classes. Perhaps the most significant aspect of these graphs is the extraordinary accumulation of stems (almost 260,000) in the 0- to 1-m height class for the Chanthaburi rubber and pineapple plantation (fig. 6, plate 6).

Spacing of Stems in Each Height Class

25. The spacing of stems in each 1-m height class is presented in the form of histograms in plate 7. Although all of the forest sites exhibit a general increase in spacing with increasing height class to a height of about 13-18 m, the Pran Buri forest (fig. 4, plate 7) exhibits a much smaller spacing for the larger height classes than the other forest sites (about 20 m as opposed to 23-40 m for the other forest sites; although one of the three data collection points in the Balboa forest, P4-01, shows maximum spacing at 20 m). The Chanthaburi forest (fig. 3, plate 7) is the reverse; the spacing value of the larger height classes is 40 m, considerably greater than that displayed by any of the forests.

26. The two rubber plantation sites display the ordered arrangement that is to be expected in a planted array of trees: the trees tend to be of approximately the same height. The peculiar shape of the histograms, with smaller spacings characterizing the taller stems, is probably the result of the practice of replacing nonproductive trees with new plantings. Thus there are always a few small, widely spaced trees in any rubber grove.

Cumulative Spacing of Stems of a Given Height Class

27. Graphs denoting the cumulative spacing of stems of a given height class and less (line A) and of a given height class and greater (line B) are displayed in plate 8. Since line A on all of the graphs is nearly a straight line extending along, and almost parallel to, the base of the horizontal axis, the cumulative spacing of stems of a given height class and less is irrelevant in this instance. Line B, however, shows a relatively uniform increase in cumulative spacing with corresponding greater stem height; notable exceptions to this trend again appear in the two Thailand plantations (figs. 5 and 6, plate 8), where the stems are grouped into only a few classes, thereby resulting in no increase in cumulative spacing for those classes that were void of stems. Notable differences in the cumulative curves (line B) for the forest sites were the wide

spacing for the taller stems in the Chanthaburi forest (fig. 3, plate 8) and the close spacing in the Pran Buri forest (fig. 4, plate 8).

PART IV: CONCLUSIONS AND RECOMMENDATIONS

Conclusions

28. Based on the descriptions and comparisons presented herein, it is concluded that:

- a. The CZ and Thailand forests were remarkably similar in the number of stems in each stem diameter class; however, in the spacing of stems in each stem diameter class and in each height class the forests showed some dissimilarity.
- b. The taller trees in the Chanthaburi, Pran Buri, and Piña forests occurred in the 30- to 33-m range, whereas the taller trees in the Balboa forest occurred in the 25- to 28-m range.
- c. The structural characteristics of the rubber plantations are very unlike those of the forests.

Recommendations

29. In view of the need for extrapolating munition effectiveness from one environment to another and for predicting performance in any given environment, it is recommended that:

- a. Work be continued on the identification of those parameters of a vegetated environment that significantly affect the performance of munitions.
- b. Additional objective comparisons be made of other DEP test environments and potential operational environments.

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5. McCullough, C. R., Johnston, I. M., and Parker, J. M., III, "Terrain Study of the Panama Canal Zone with Specific Reference to the Ft. Sherman Area and Vicinity," Contract Report No. 3-18, July 1956, U. S. Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss.; prepared by North Carolina State College, School of Engineering, Raleigh, N. C.

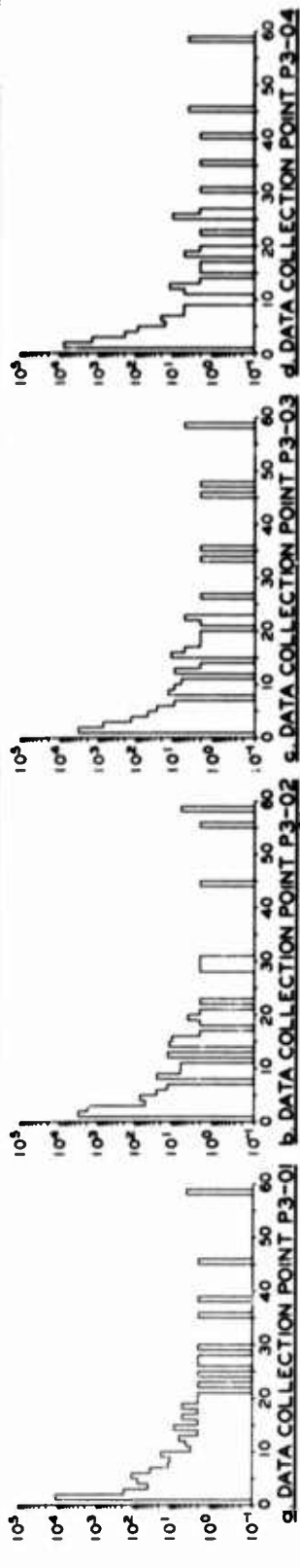


FIG. 1. PIÑA FOREST SITE

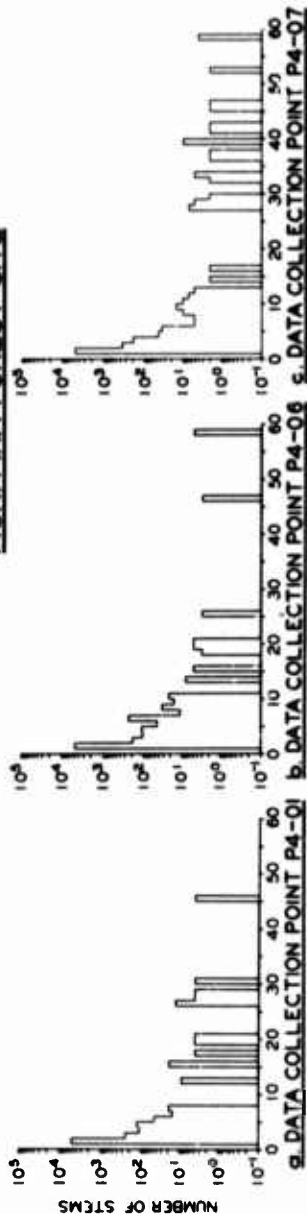


FIG. 2. BALBOA FOREST SITE

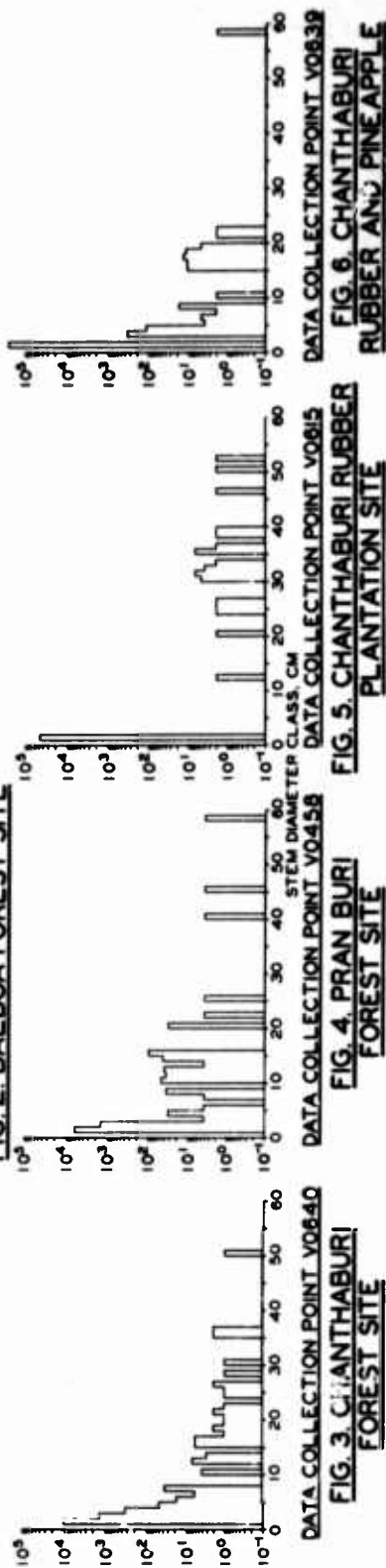


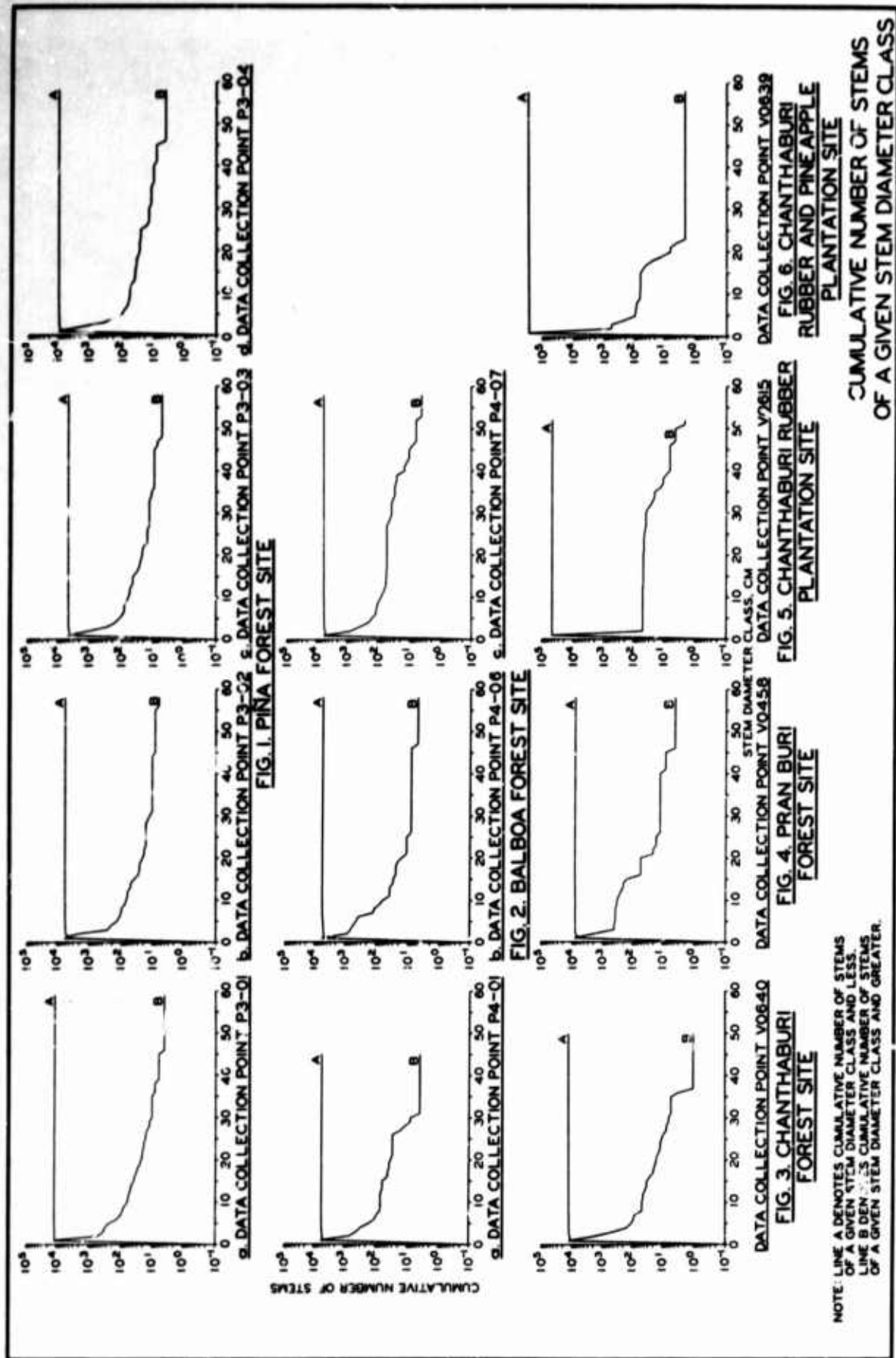
FIG. 3. CHANTHABURI FOREST SITE

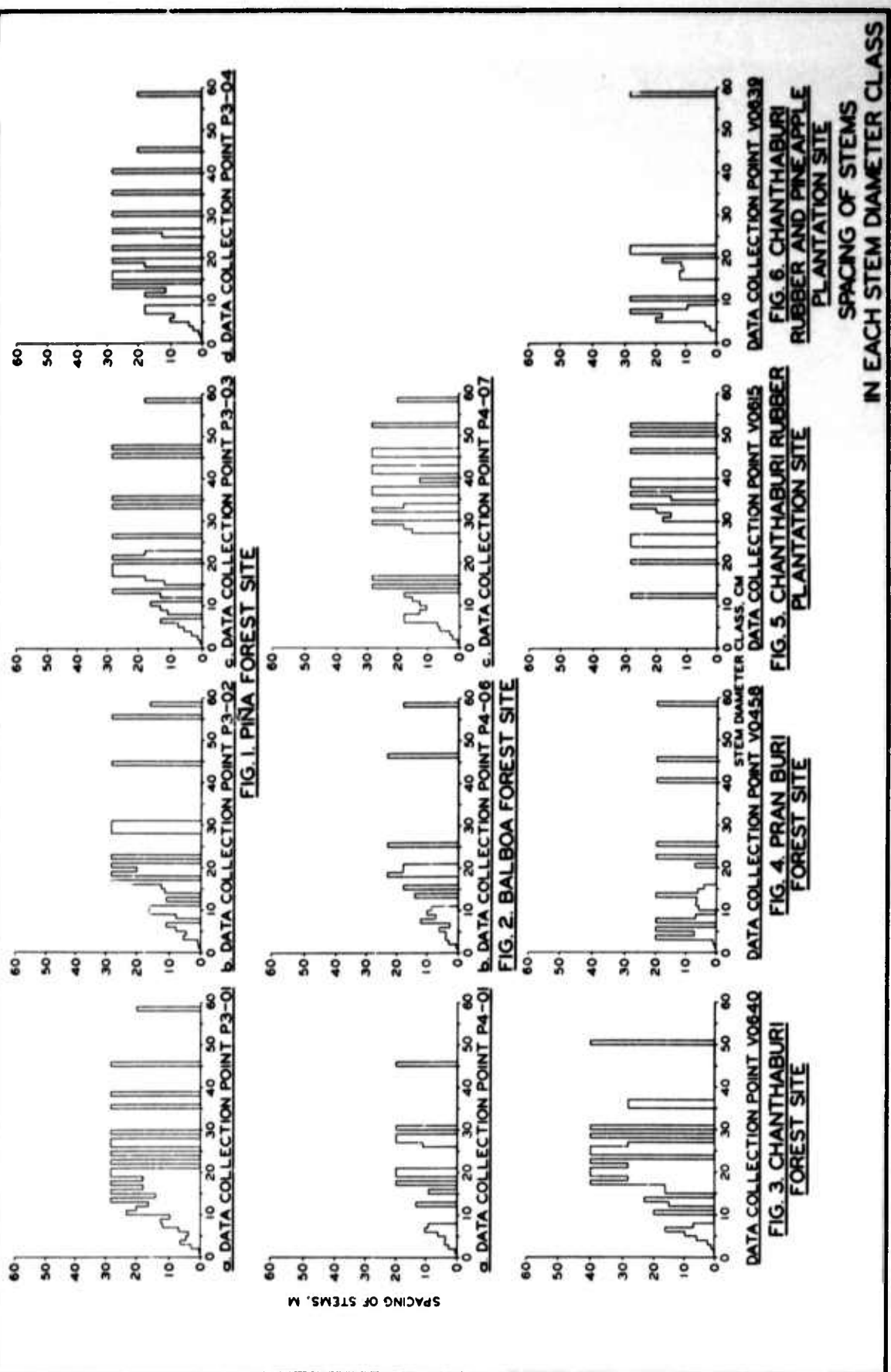
FIG. 4. PRAN BURI FOREST SITE

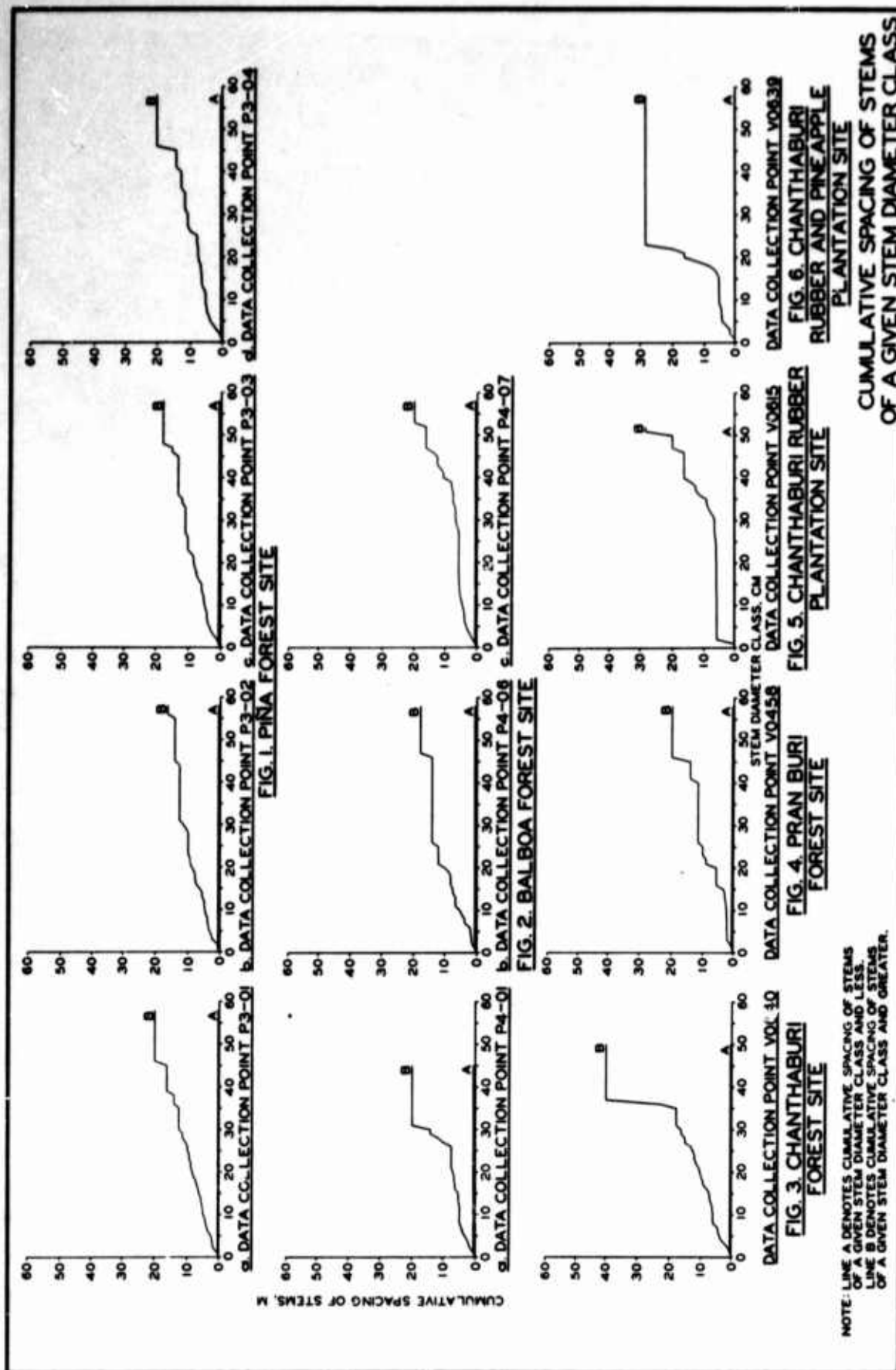
FIG. 5. CHANTHABURI RUBBER PLANTATION SITE

FIG. 6. CHANTHABURI RUBBER AND PINEAPPLE PLANTATION SITE

NUMBER OF STEMS
IN EACH STEM DIAMETER CLASS







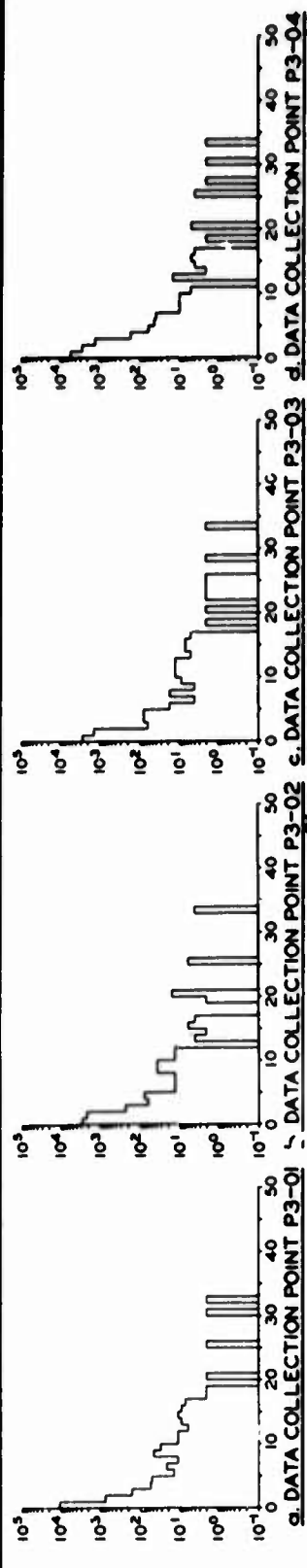


FIG. 1. PINA FOREST SITE

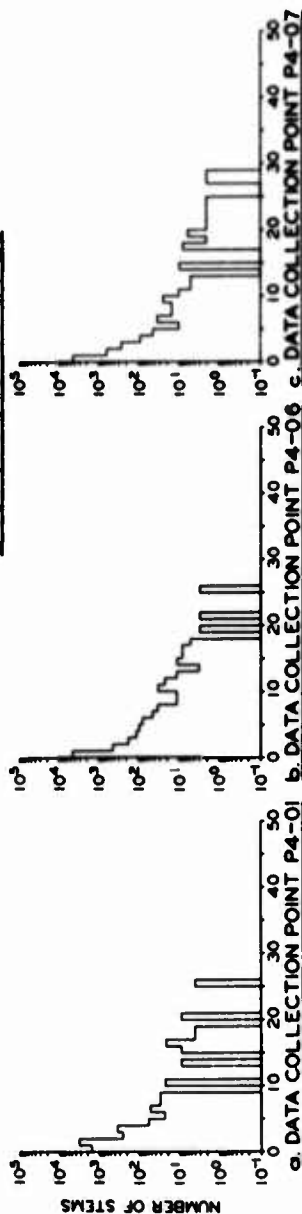


FIG. 2. BALBOA FOREST SITE

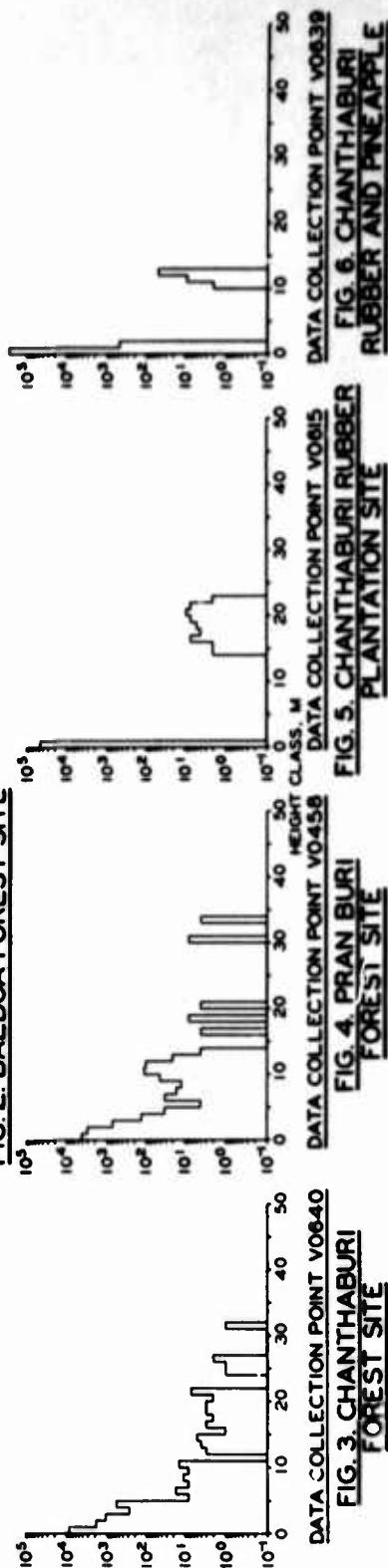


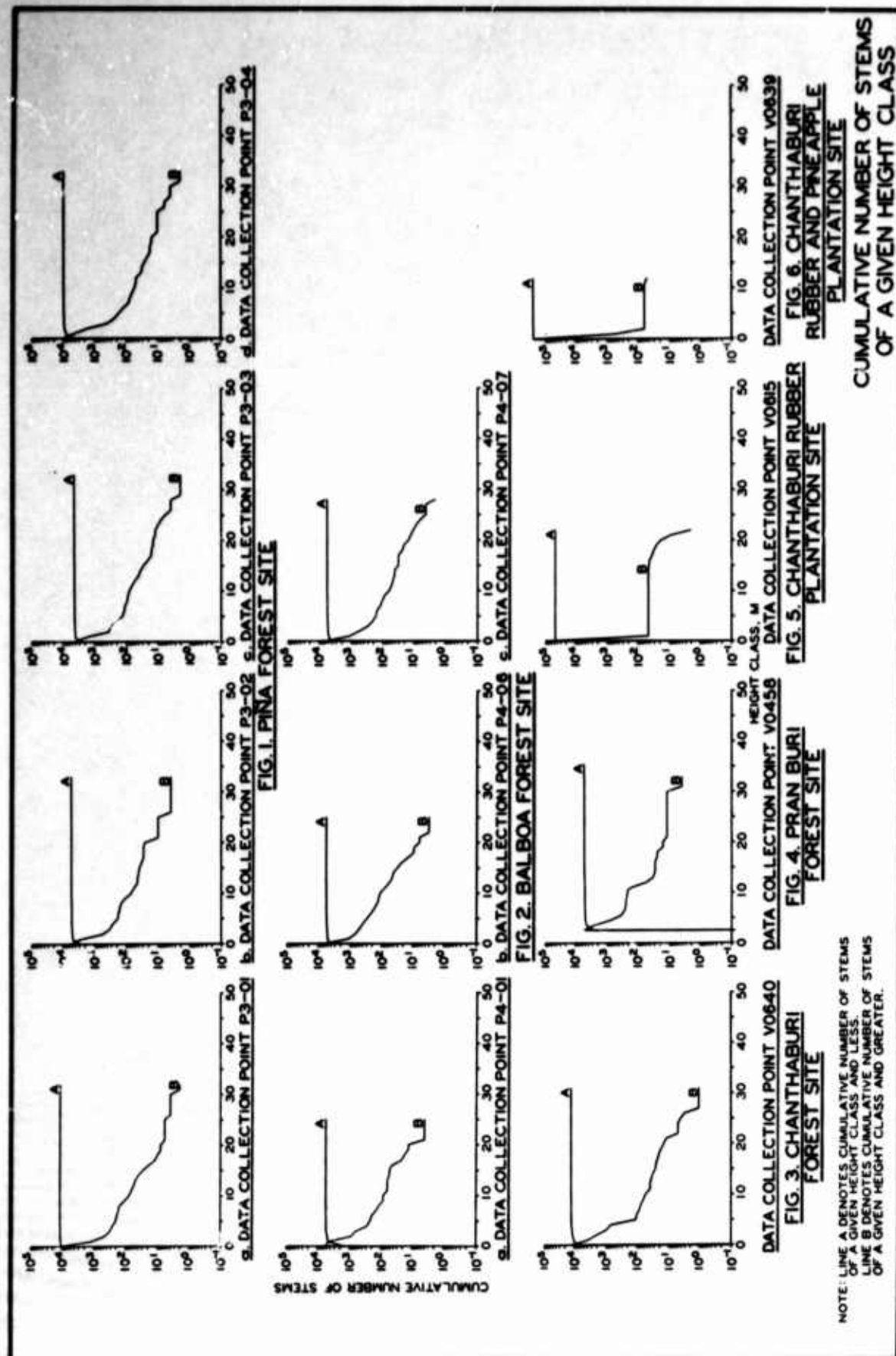
FIG. 3. CHANTHABURI FOREST SITE

FIG. 4. PRAN BURI FOREST SITE

FIG. 5. CHANTHABURI RUBBER PLANTATION SITE

FIG. 6. CHANTHABURI RUBBER AND PINEAPPLE PLANTATION SITE

NUMBER OF STEMS
IN EACH HEIGHT CLASS



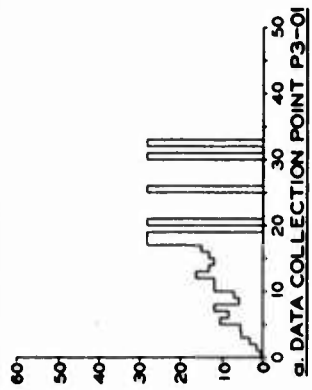
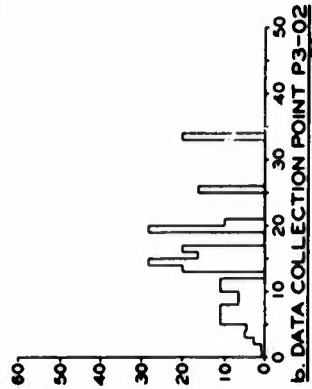
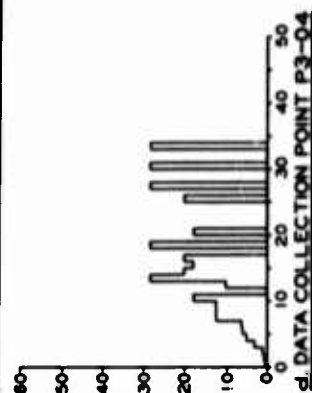


FIG. 1. PINA FOREST SITE

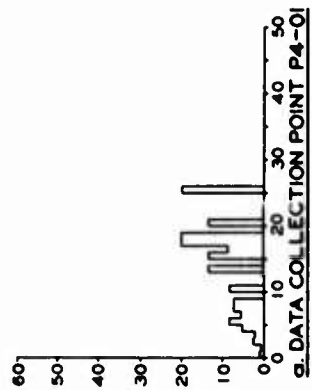
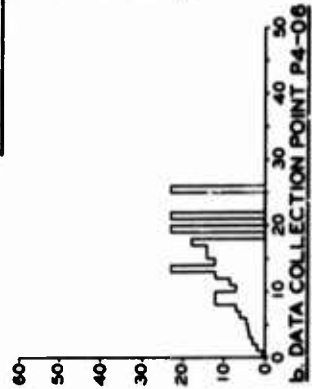
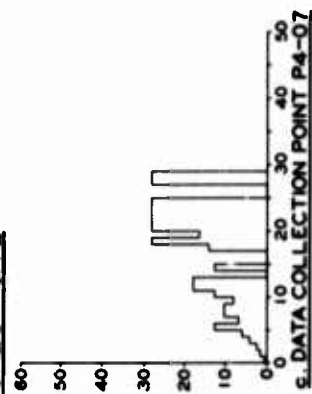


FIG. 2. BALBOA FOREST SITE

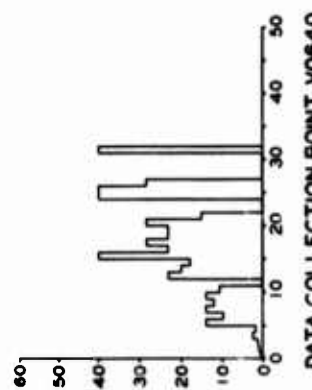
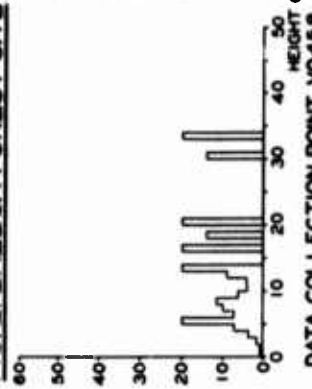
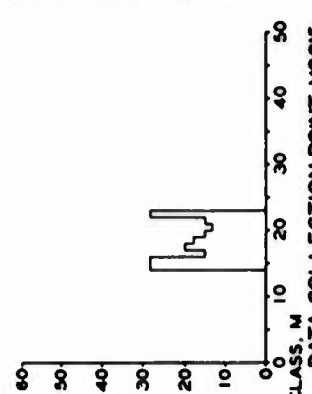
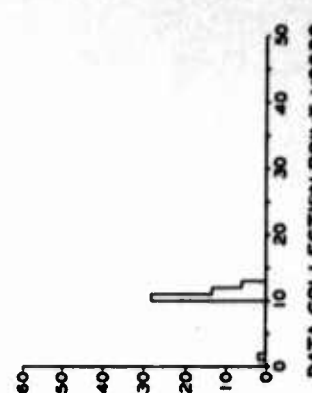


FIG. 3. CHANTHABURI FOREST SITE

FIG. 4. PRAN BURI FOREST SITE

FIG. 5. CHANTHABURI RUBBER PLANTATION SITE

FIG. 6. CHANTHABURI RUBBER AND PINEAPPLE PLANTATION SITE

SPACING OF STEMS
IN EACH HEIGHT CLASS

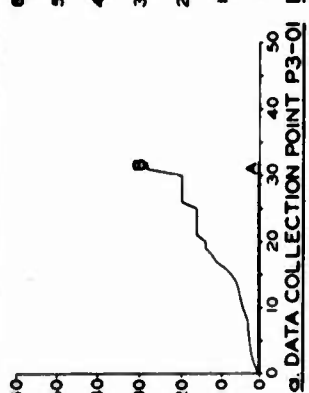
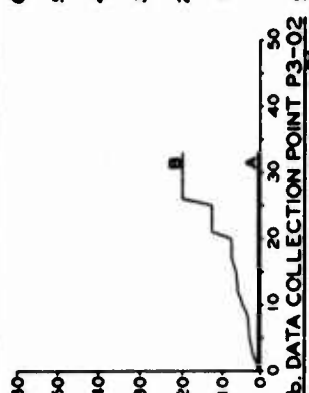
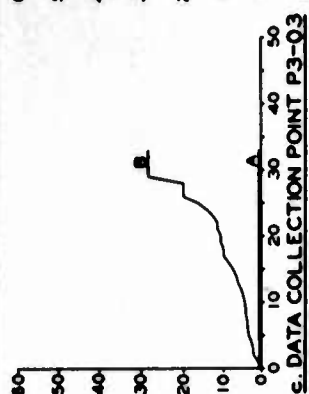
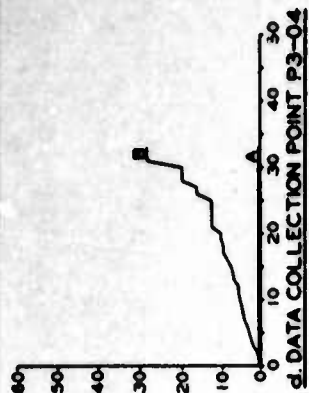


FIG. 1. PINA FOREST SITE

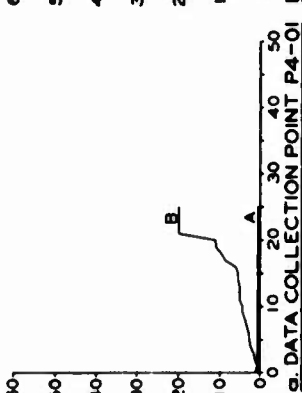
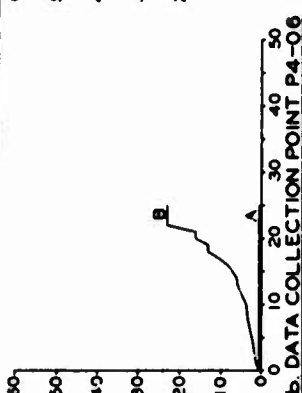
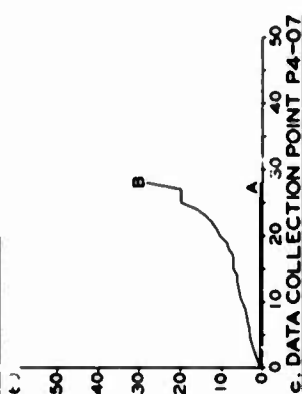


FIG. 2. BALBOA FOREST SITE

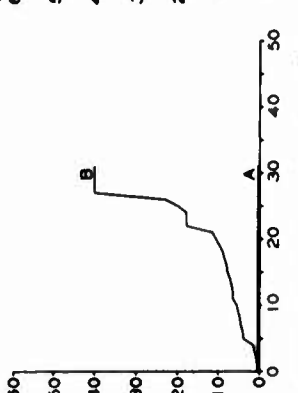
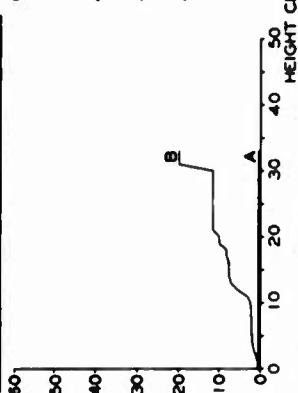
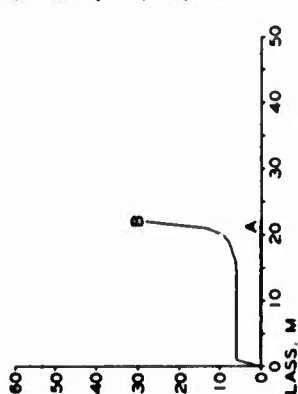
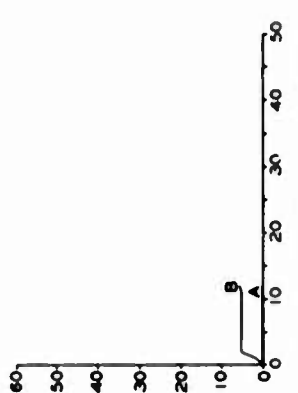


FIG. 3. CHANTHABURI FOREST SITE

FIG. 4. PRAN BURI FOREST SITE

FIG. 5. CHANTHABURI RUBBER PLANTATION SITE

FIG. 6. CHANTHABURI RUBBER AND PINEAPPLE PLANTATION SITE

NOTE: LINE A DENOTES CUMULATIVE SPACING OF STEMS OF A GIVEN HEIGHT CLASS AND LESS.
LINE B DENOTES CUMULATIVE SPACING OF STEMS OF A GIVEN HEIGHT CLASS AND GREATER.

CUMULATIVE SPACING OF STEMS OF A GIVEN HEIGHT CLASS

APPENDIX A: PROCEDURE FOR SAMPLING VEGETATION PHYSIOGNOMY

Data Collection Procedure

1. Collection of vegetation structural data in the field is accomplished most economically in open and simple structures with a three-man team, and in complex structures with a four-man team. Basic instrumentation consists of a Brunton compass and tripod (a site-marker transit or an alidade and plane table may be substituted under most conditions), a 30-m tape or chain, a range pole, and an Abney level (or similar instrument for measuring vertical angles). The Brunton compass is set up at any arbitrary location, and an arbitrarily oriented line of sight (usually magnetic north) is established. Each plant large enough to be significant is located by distance and azimuth, and its physiognomy is described in accordance with the definitions given below. Normally all of the plants in a relatively small annulus, with the Brunton compass at the center, are first described. Another annulus is then added and so on until a sufficiently large area is covered. Any circular area that encompasses at least 20 individuals of any designated structural type is considered to be a structural cell. Such a cell is believed to be the minimum area required to obtain a statistically significant sample of a given plant assemblage.*

Explanation of Vegetation Data Form

2. Definitions of information placed on the vegetation data form (plate A1) at a sample site are given in the following paragraphs. The annotation format is as follows: first, the type of information; second, a number or set of numbers in parentheses, identifying the column numbers in which the information is to be placed on the ADP cards (see Appendix B)

* For a detailed discussion of sampling theory and practice, see: H. L. Mills, "The Physiognomy of Vegetation: A Quantitative Approach to Vegetation Geometry Based upon the Structural Cell Concept as the Minimum Sample Size," Contract Report No. 4-103, May 1964, U. S. Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss.; prepared by Marshall University, Huntington, W. Va.

(this number also appears on the vegetation data form in parentheses under heading items, and at the head of columns on the body of the form); and third, a definition or other comment, as required in order to convey the exact form of data specified. When applicable, the code numbers used by the field crew for any encoded parameter are given within the definition or explanation of that parameter.

Heading items on data form

3. Heading items (see top of vegetation data form, plate A1) are those that contain general site and sampling information as follows:

- a. Country (1-3). Each country (nation) is assigned a number from 001 through 999. The number for Panama is 103, and for Thailand, 132.
- b. Site number (4-7). Within any given country, vegetation sample sites (referred to as data collection points in the main text of the report) are numbered consecutively from 0001 to 9999. For the DEP project an additional sample number that includes one letter is used to further identify the test area. The field party normally assigns the identification number.
- c. Data group (8). This term designates the factors for which data are recorded on a given data sheet. The data group for vegetation data is signified by the printed "1" in the appropriate space.
- d. Sample number (9-10). This is defined as the number of times the specific site has been sampled for this data group. The sample numbers will be 01 through 99. A new number is given if a sample site has been completed, then at some later time resampled.
- e. Cover card identifier (11-13). Each sample site card deck has a cover card that provides certain general information, such as date, and so on. Cover cards must be removed before the data cards are analyzed. This column field corresponds to the field for "item number," on the data cards. Since "item number" is always some real positive value, a blank field in columns 11-13 identifies a cover card.
- f. Date (14-19). The date of the sample will be recorded in the sequence, day, month, year; thus: day, 01 through 31; month, 01 through 12; year, last two digits of the number of the year.
- g. Number of lines in sample (20-22). This is the total number of lines occupied by data on the data sheet or sheets for this particular sample, including supplementary lines. It will not necessarily indicate the number of items in a

sample, since there are many cases in which an item may occupy more than one line.

- h. Data system reference (23). This is a reference to the set of definitions and instructions according to which these data were collected. The references may be spelled out on the data sheet and the index number inserted at the time of punching. The code is 4 for these samples.
- i. Data form reference (24). This is a reference to the data form (form number and date) from which these cards are punched. As with the data system reference, a file of data forms is maintained at WES. This reference number (2) is printed on the data sheet.
- j. State (25-27). The term "state" describes any secondary political subdivision ("country" being the primary subdivision). Thus it may be a state (U. S.), province (Canada), changwat (Thailand), Canal Zone (Panama), etc. On the data sheet it should be written out; a suitable number code will be devised by WES at the time the cards are punched. The code for the Canal Zone in Panama is 003.
- k. Geographic coordinates (28-40). The geographic coordinates of the sample site, as nearly as these can be determined, will be recorded as follows:
 - (1) Longitude. Columns 28-30, degrees; columns 31-32, minutes; columns 33-34, seconds.
 - (2) Latitude. Columns 35-36, degrees; columns 37-38, minutes; columns 39-40, seconds.
- l. Map reference (41-58). This should be a complete reference to any generally acceptable map of the area in which the sample site is located. In general, the information contained in the columns will be publisher, sheet or index number, and grid coordinates. This should be abbreviated and arrayed for coding when the data are edited for punching.
- m. Unassigned columns (59-80). Twenty-two columns on the cover card have not yet been assigned; these may be used to encode any additional notes or remarks that may be appropriate. The field team has no responsibility in this regard beyond recording what notes are appropriate.

Information on data form, sheet 1

4. Information on the first page of the data form is discussed in the same format as that for the heading items (paragraph 3 above).

- a. Identification (1-10). These columns for a line of actual data contain the same information as that for similar columns on the cover card.

- b. Item number (11-13). This refers to the number of the structural component being described. A structural "component" is either a single plant, or any aggregation of plants so closely allied that the aggregation can be described on a single line of the field data form. Item numbers will be repeated when two or more lines are required to record necessary data.
- c. Line number and number of lines (14-15). "Line number" refers to the order in which this line appears in the recording of data concerning an item. "Number of lines" refers to the total number of lines necessary to describe an item, including those lines concerning that item on the supplementary data sheet if any line appears there.
- d. Data sheet (16). This simply refers to the page of the data form, either "1" or "2." This number is printed on the data sheet.
- e. Location (17-23). This information locates the item of interest with respect to distance, in centimeters, from the plot center and its azimuth in degrees. North is recorded as 360, not 0.
- f. Height of plant (24-28). The height in centimeters is recorded as the vertical distance from the ground to the top of the plant. The height class refers to the category of heights assigned in the following list:

<u>Class</u>	<u>Height, cm</u>
1	0 to less than 10
2	10 to less than 30
3	30 to less than 100
4	100 to less than 200
5	200 to less than 500
6	500 to less than 1300
7	1300 to less than 3500
8	3500 or more

g. Crown (29-33).

- (1) Crown shape is the gross outline of the crown as viewed against a vertical plane. The following categories, which of necessity are somewhat subjective, are as follows:

<u>Shape Category</u>	<u>Description</u>
1	Round. Top of crown round or nearly so, base of crown rounded or broad.
2	Flat topped. Top of crown flat or nearly so, base of crown rounded or tapered

(Continued)

Shape Category	Description
3	Pointed. Top of crown conical or pointed, base of crown rounded or broad
4	Spindle. Top of crown conical or pointed, base of crown slender or long tapered toward stem
5	Irregular. Crown shape not classifiable or undeterminable
6	Crownless. Branch mass is absent, but stem is still anchored to the ground
7	Conforming. Leaf or branch mass essentially conforms to configuration of ground or supporting plant or structure. (Associated primarily with decumbent plants and vines.)

- (2) Crown diameter is the diameter of the crown when projected on a horizontal plane. (NOTE: If the outline of the crown as projected on a horizontal plane is quite irregular, the crown area is measured as the area of an irregular polygon, and the crown diameter is determined as the diameter of the circle of equivalent area. If the crowns of several plants with similar characteristics (i.e. identical structural elements) are closely intermingled, the polygon is applied to the group, the area proportioned among the several plants under consideration, and then converted to the diameter of equivalent circles.)

If the center of the circle of the crown (in plan view) is significantly offset (e.g. approximately one-half the crown radius, or more) from the base of the stem, as in the case of strongly leaning plants, or plants with lop-sided crowns, description of the plant will require two lines on the data sheet, but both with the same item number. On the first of the two lines, the crown shape and diameter are recorded and all other information is recorded as pertinent. In column 75, a "2" is recorded. The location (distance and azimuth) on this line pertains to the stem. On the second of the two lines, the location (distance and azimuth) of the center of the crown circle is recorded in the appropriate columns; and all other columns are left blank. The occurrence of blanks in these columns will identify it as a special case.

If the crown (in plan view) is too irregular to be readily normalized to a circle (or if several crowns are to be recorded collectively as a single item) as many

lines as necessary are used to describe the crown, but all lines have the same item number. On the first of these lines, the crown diameter is recorded as "0," and all other data including crown shape are supplied in the appropriate columns. The location (distance and azimuth) on this line will pertain to the stem. Any required number of subsequent lines may be used for recording the distances and azimuths to the turning points on the polygon of the irregular crown. On these lines the identification data and crown shape data are repeated, and all other data are recorded as "0." For analysis, the fact that there are three or more lines shows the recorded locations can only be turning points on a polygon. The last line of such a series outlining an irregular crown must describe the same location as the first, i.e. the polygon must be closed.

- h. Crown branching (34-42). A branch is any protuberance from any stem of the plant definitely a part of the crown and protruding more than 10 cm, measured horizontally from the stem, but not satisfying the definition of stem. It shall be considered to be as follows: for plants less than 30 cm tall, not applicable, recorded as "0"; for plants 30 to less than 500 cm tall, applicable as defined; for plants 500 cm tall or over, applicable when the protuberance has a diameter of 1 cm or more and a horizontal distance of 10 cm from the surface of the stem (i.e. for plants of this height and with no protuberance satisfying this criterion, hardness and all factors thereof will be none), recorded as "0."
- (1) Crown branching height is the vertical height in centimeters from the base of the plant, or from a horizontal plane through the base of the plant, to the point on the stem at which the lowest branch (as defined) emerges, EXCEPT for epiphytes in which the branching height is the height of attachment to the supporting plant.
 - (2) Crown branch diameter is the diameter in centimeters of the branch (as defined) at a distance of 10 cm, measured horizontally from the surface of the main trunk. If significant, the actual measurement of the diameter, in millimeters, is noted in the comments column. The abbreviation CBD in the comments column denotes crown branch diameter.
 - (3) Crown branch angle is the angle formed between the branch and a line drawn vertically downward from the intercept of the branch axis with the stem axis. See plate A2. Branch angle is measured in degrees from 1 to 180. When the branches are so entangled as to make finding the branch angle difficult or impossible, 181 should be recorded in the column field.

1. Stem (43-55). The stem is the dominant or main axis of the plant; specifically, the largest axis at the height where the diameter is measured, and all other axes equal to or greater than one-half that diameter at that height. Stem characteristics for plants less than 10 cm in height are recorded as "0."

- (1) Stem diameter is the diameter in centimeters of the cross-sectional circle of the stem at the height specified according to the list below. If significant, the actual measurement of the diameter, in millimeters, is noted in the comments column. The abbreviation STD in the comments column denotes stem diameter.

<u>If Height of Stem Is</u>	<u>Measure Stem Diameter at</u>
3500 cm or more	150 cm
1300 cm to less than 3500 cm	150 cm
500 cm to less than 1300 cm	150 cm
200 cm to less than 500 cm	100 cm
100 cm to less than 200 cm	30 cm
30 cm to less than 100 cm	10 cm
10 cm to less than 30 cm	Ground level
0 cm to less than 10 cm	Not measured

- (2) The number of stems is a numerical count of all of those axes of a given individual that qualify as stems according to the definition set forth above and recorded in centimeters from 1 through 99. In those cases where only one line on the data form is used to describe an aggregation of like plants (grasses, etc.) these columns are used to record the total number of stems counted in the structural cell. (Any axes at this height that are not stems by definition must, of course, be considered to be branches.)
- (3) Stem attitude is the angle formed by the intercept of an idealized axis of the stem with a plane horizontal through the base of the plant. Stem attitude is not measured in the field, nor recorded on the data sheet; instead, the values necessary for its calculation are measured and recorded thus:

See plate A3. Assume a plane horizontal through the base B of the plant, or let B be the point at which the stem contacts the ground. Drop a vertical (XV) to this plane from a point (X) on the stem 2 m above the plane, or from the geometric center of the crown, plan view, whichever is lower. The horizontal distance (BV) is measured and recorded. The stem attitude is described by the angle VBX which can be calculated.

- (4) Sinuosity is the ratio of the actual length of that segment of the stem within a specified zone having its lower limit as the surface of the ground, to the length of an idealized axis of that stem within that zone. As with stem attitude, sinuosity is not measured in the field; instead, the values necessary for its calculation are measured and recorded thus:

Continuing the notation of plate A3, measure the actual length L of the stem axis from B to X and record in centimeters. For plants less than 2 m tall, X is at the geometric center of the crown.

- (5) Detached is a condition intended to accommodate plants or plant material not anchored in the soil. It is recorded using the following code:

- 0. Not applicable or none
- 1. Not detached
- 2. Detached

- (6) Hardness of a stem is determined by attempting to push a pencil point into the stem. If it can be easily penetrated it is soft, etc. It is recorded using the following code:

- 0. Not applicable or none
- 1. Hard
- 2. Soft

- j. Stem branching (56-68). A stem branch is any protuberance from any item of the plant that protrudes more than 10 cm, measured horizontally from the stem but not satisfying the definition of stem. It is considered to be the same as crown branching except when the stem branching does not constitute part of the crown. Stem branching characteristics for plants less than 10 cm tall are recorded as "0."

- (1) Stem branching height, diameter, and angle are measured and recorded in the same manner as that for crown branching (see paragraph 4h). If significant, the actual measurement of the diameter, in millimeters, is noted in the comments column. The abbreviation SBD in the comments column denotes stem branch diameter.

- (2) Stem branching length is the horizontal distance in centimeters from the point of emergence from the main stem to a point vertically above or below the tip of the branch.

- k. Foliage (69-74). The term "leaf" is defined to include fronds and other analogous organs displaying leaflike

characteristics. Foliage characteristics are recorded only when leaves, either living or dead, are actually present on the plant.

(1) Size-shape is determined by a direct measurement of the length and a computed ratio of width to length, length being considered to be always the greater of the two measurements and width the measurement across the leaf perpendicular to the length. Length and width are defined so that the width/length ratio can never exceed 1. If the ratio is equal to 1, it is recorded as 99. In the case of very small leaves, even though the length is recorded to the nearest centimeter, the width/length ratio is determined by any sufficiently small unit of measure. Foliage lengths of 100 cm or greater are recorded as 99 in columns 69 and 70. The actual measurement of the length is noted in the comments column.

(2) Texture can be described by any one of the following five alternatives (with code numbers preceding):

0. Foliage absent.

1. A filmy leaf is one that is characterized by its translucency.

2. A membranous leaf is one that is not permanently deformed when wrapped around a pencil. (NOTE: "upper" surface is placed next to pencil.)

3. A hard leaf is one that is permanently deformed when wrapped around a pencil.

4. A succulent leaf is one that is more than 2 mm thick.

(3) Condition refers to whether the leaves are living (1) or dead (2), or if absent (0).

l. Supplementary line (75). Frequently more than one line on the first page of the data form is needed to adequately describe an item. For this project two lines are used to record the azimuth and distance of the center of an "offset" crown (i.e. for a crown whose geometric center is not directly, or nearly so, above the point of stem emergence from the ground. When it is necessary to use more than one line, a code number is placed in column 75 to indicate that more than one line has been used. The number 2 in column 75 for an item indicates that "this tree has an offset crown and its polar coordinates are given in the next line." Only columns 1-23 will be filled in in that case.

m. Supplementary card (76). This information denotes whether or not any more information can be found on the supplementary data sheet (page 2 of plate A1). The code used for this

column generally describes the kind of information that is to be found. At present there are five alternatives that can be described by this column. They are given below together with their code number:

0. No supplementary card for this item.
1. Supplementary card used for this item; it is a comment card and its contents must be examined for possible significance.
2. Armature present.
3. Aboveground roots present.
4. Combination of any of the above.

Information on data form, sheet 2

5. The purpose of the second page of the data form (plate A1, sheet 2) is to allow the recording of supplementary data, that is, data that are applicable for only a selected number of all plants measured. Specific data for comments, armature, and aboveground root characteristics are recorded according to the following:

- a. Identification (1-10) is the same as those for the cover card, see paragraph 3e.
- b. Item number (11-13). The item number on the supplementary page is the same as that on the first page.
- c. Line number and number of lines (14-15). See paragraph 3g. These columns indicate the total number of lines on both pages of the form necessary to describe an item.
- d. Data sheet (16). This number is printed on the data sheet. The number is the page of data.
- e. Location (17-23). These columns repeat the information for the item on the first page to which these lines of data refer.
- f. Armature (24-27). When a "2" appears on data sheet 1, column 76, further information regarding the position of the armature is recorded in this column field. The following code is applied regarding the position of these types of armature: spines equal to or greater than 5 mm, spines less than 5 mm, cutting edges, and stinging organs. If none are present, a "0" is placed in the column(s).
 1. Stem and/or branches
 2. Foliage
 3. Fruit

4. Stem and/or branches, foliage
 5. Stem and/or branches, fruit
 6. Foliage and fruit
 7. Stem and/or branches, foliage, and fruit
- g. Root habit (28-34). Aboveground root structures are recorded on data sheet 1, column 76, as "3." When such structures are present additional information will be recorded on the supplementary data sheet.
- (1) Root habit type may be one of the following:
 1. Stilt or prop roots
 2. Enlarged base
 3. Plank buttresses
 - (2) The height is the measured value in centimeters of the vertical distance from the base of the plant to where the root modification diverges from the stem.
 - (3) The spread of the root habit is the diameter in centimeters of the mass of the root modification at ground level.
- h. Columns 35-80 are used for other comments or other supplementary material. Where supplementary information is recorded on sheet 2, a 1 is recorded in column 76 on sheet 1.

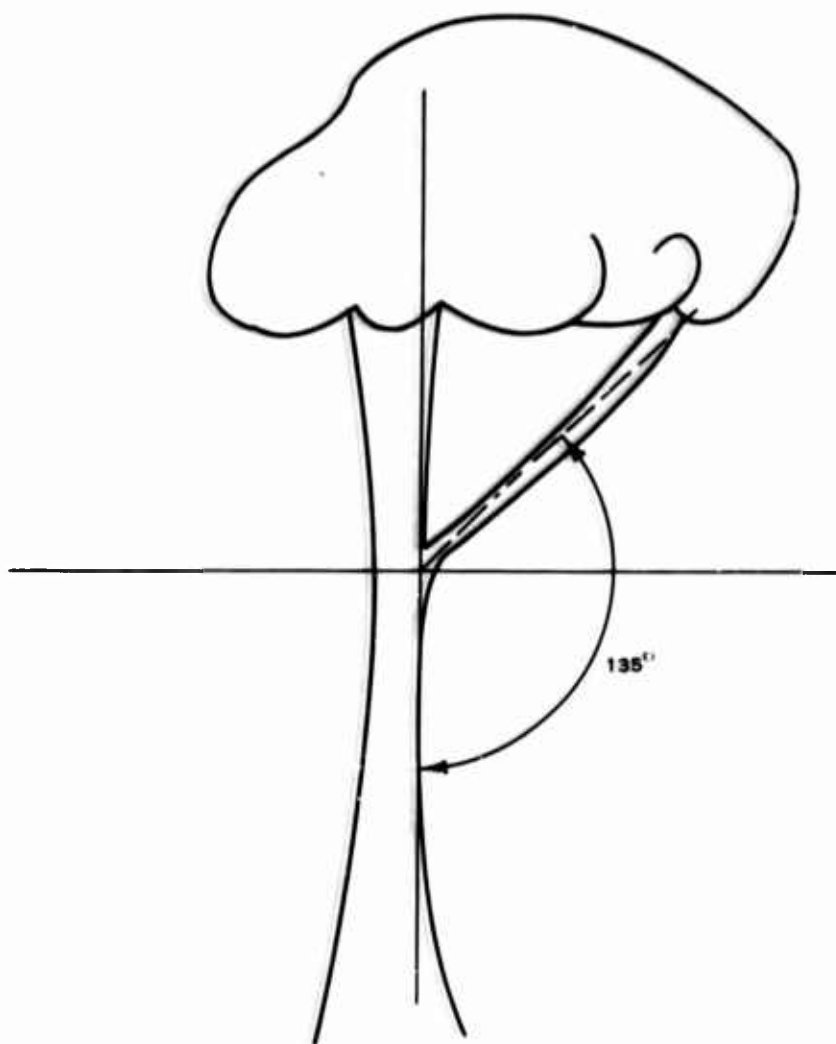
VEGETATION STRUCTURE DATA

IDENTIFICATION: COUNTRY (1-3) SITE NUMBER (4-7) SUBSIDIARY DATA: DATE (DAY, MONTH, YEAR, 14-19) LINES IN SAMPLE (20-22) DATA SYSTEM REF (23)
 PAGE / DATA GROUP 1 SAMPLE NUMBER (8) DATA FORM REF 2 STATE (23-27) GEOGRAPHIC COORD (28-40) MAP REF (41-44)

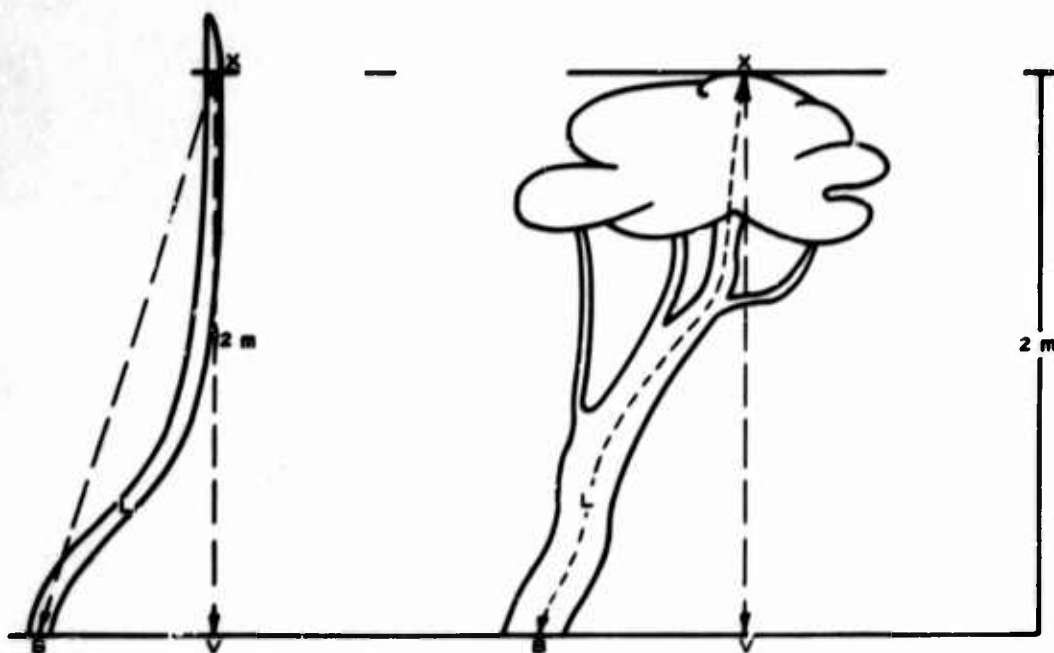
ITEM NUMBER	LINE NUMBER	NUMBER OF LINES	DATA SHEET	LOCATION		HEIGHT OF PLANT		CROWN		CROWN BRANCHING			DIAM			STEM				STEM BRANCHING				FOLIAGE				FIELD PERSONNEL																																							
				DISTANCE FROM PLOT CENTER	AZIMUTH	MEASURED	CLASS	SHAPE	MEASURED	DIAMETER	CLASS	HEIGHT	DIAM	ANGLE	MEASURED	DIAM	ANGLE	MEASURED	CLASS	NUMBER OF	HORIZ DIST (BV)	ATTITUDE	LENGTH	SINUOSITY	HARDNESS	MEASURED	HEIGHT		DIAM	ANGLE	LENGTH	MEASURED	LENGTH	MEASURED	WIDTH	TEXTURE	CONDITION	SUPPLEMENTARY LINE	SUPPLEMENTARY CARD	NOTES																											
11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76		

PLATE A1 (2 of 2 sheets)

[illegible]



DETERMINATION OF
BRANCH ANGLE



XV = HEIGHT OF PLANT
 B = BASE OF PLANT
 L = LENGTH OF STEM

GEOMETRY FOR MEASURING STEM
 ATTITUDE AND SINUOSITY

APPENDIX B: DATA REDUCTION AND PRESENTATION

1. The object of the columned vegetation structure data form and the codes shown in Appendix A is to make the field data compatible with automatic data processing procedures. After a brief check of the field data and the coding of various items such as location, map reference, etc., the sheets of raw data were given to a punch card operator for placing onto standard automatic data processing (ADP) cards. The column numbers on the data forms (see plate A1, sheets 1 and 2) correspond to the column number on the ADP cards. The card deck for each sample site consists of three types of cards: a cover card containing the general heading information; a set of data cards containing the detailed structural information from sheet 1 of the form, plate A1; and a set of supplementary cards containing data recorded on the second sheet of the data form, plate A1. The kinds of data included on these cards are described in detail in Appendix A.

2. With the field data punched onto ADP cards, various computer programs were used to present, reduce, or otherwise manipulate the data. Tables B1-B11 are computer print-outs of the basic structural data for the seven data collection points in the Panama Canal Zone and the four data collection points in Thailand.

3. Certain special computer programs have been written to compute structural relations not necessarily obvious from scrutinizing the raw data. Two programs used herein compute the spacing and cumulative spacing of stems and the number and cumulative number of stems included in each 1-cm-stem-diameter class and each 1-m-stem-height class. The information generated by these programs was used to prepare the histograms and graphs shown in plates 1-8 in the main text of this report. Tables B12-B22 are print-outs of the results of computations used to prepare the histograms and graphs. The histograms and graphs were prepared with an automatic plotter.

4. In accordance with the concept of the structural cell, a much larger circular area was sampled for the larger plants than for the smaller ones in a given plant assemblage. For example, for data collection point P4-01 the circular area for sampling at least 20 plants in height class 4

was 6 m in diameter, whereas for height class 7 it was 23 m. When analyzing the data, however, it became evident that all plants at a given data collection point(s) would have to be put on a common unit area basis. Therefore, the area representing the largest structural cell diameter occurring in the 11 data collection points was selected as the unit area. (The structural cell diameter used was 40 m and occurred in the Chanthaburi forest.) Because of this expansion, it became necessary to calculate the number of smaller plants that would have been sampled in a larger cell ("expanded cell"). The formula used for this expansion is

$$N_2 = \left(\frac{D_2^2}{D_1^2} \right) N_1$$

where

N_1 = the number of stems of a given stem diameter class in the original cell

N_2 = the number of stems of a given stem diameter class in the expanded cell

D_1 = the diameter of the original cell

D_2 = the diameter of the expanded cell

The computed data used to construct the histograms and graphs in plates 1-8 in the main text utilize information based on expanded cells.

5. Because some of the trees have very large stem diameters, it was necessary to write the stem diameter computer program in such a way that all stem diameters could be used. This resulted in storage of all stems having diameters equal to or greater than 58 cm as if they exhibited a stem diameter of 58 cm. Thus, in the histograms and graphs in plates 1-8 this class usually contains stems of several stem diameter classes and thereby results in apparent increases in the number of stems and apparent decreases in spacing of stems for this stem diameter class.

6. On the basis of inadequate field sampling (less than 20 stems as discussed in paragraph 1, Appendix A), the trees that occurred in height class 8 (trees with heights greater than 35 m) in data collection points P4-01 in the Balboa forest and P3-01 in the Piña forest were excluded. It is believed that, if adequate samples could have been obtained of the

height class 8 trees in the PiMa and Balboa forests, spacing of stems would probably have occurred in the 100- to 150-m range. For the structural description of the height class 8 trees that did occur in data collection points P3-01 and P4-01, see tables B1 and B5, respectively.

Vegetation Structure Data, Data Collection Point P3-01

[illegible]

(1 of 3 sheets)

Table B1 (Continued)

DATA SHEET 1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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S	U	P	T	Y	D	A	M	P	L	M	S	L	I	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A	M	P	L	M	S	D	C	A

Table B1 (Continued)

DATA SHEET 1																															
C O U N T Y	S I T E	D A T A	S I T E	L I N E	L I N E	D A T A	D E S C R I P T I O N	A L L I E N T	M I S S I O N	M I S S I O N	C R I M I N A L	C R I M I N A L	GR BRANCHING				STEM				STEM BRANCHING				FOLIAGE				S U P P L Y	S U P P L Y	
													H Y	D I A M	D I A M	N O	S T E M	D I A M	D I A M	L E N G T H	L E N G T H	J U N C T I O N	S T E M	S T E M	S T E M	S T E M	S T E M	S T E M			
103	0012	1	01	191	1	2	1 0600	042	1300	7	5	0400	0600	04	160	015	01	000	200	1	1	0600	04	160	0300	12	00	1	1	0	0
103	0012	1	01	192	1	1	1 0600	042	1400	7	7	0000	0000	00	000	003	05	000	200	1	1	0000	00	000	0000	00	00	0	0	0	0
103	0012	1	01	193	1	2	1 1100	054	1400	7	5	0000	0300	03	160	027	05	000	200	1	1	0300	03	160	0100	20	00	1	1	0	0
103	0012	1	01	194	1	1	1 1200	070	2000	7	7	0000	0000	00	000	012	01	000	400	1	1	0000	00	000	0000	00	00	0	0	0	0
103	0012	1	01	195	1	1	1 1400	070	1400	7	5	1000	0900	13	165	022	01	000	200	1	1	0900	13	165	0400	12	00	1	1	0	0
103	0012	1	01	196	1	1	1 1900	002	1400	7	5	0300	0900	04	120	016	01	000	400	1	1	0900	04	120	0200	12	00	1	1	0	0
103	0012	1	01	197	1	1	1 1900	002	1300	7	7	0000	0000	00	000	001	04	000	200	1	1	0000	00	000	0000	00	00	0	0	0	0
103	0012	1	01	198	1	1	1 1300	094	1600	7	5	0400	1000	02	140	010	01	000	200	1	1	1000	02	140	0100	12	00	1	1	0	0
103	0012	1	01	199	1	1	1 1300	094	1600	7	7	0000	1000	00	000	001	07	000	200	1	1	0000	00	000	0000	00	00	0	0	0	0
103	0012	1	01	160	1	2	1 1000	110	3200	7	5	1900	1700	09	190	199	01	000	200	1	1	1700	09	190	0700	12	00	1	1	0	0
103	0012	1	01	161	1	1	1 1000	110	2900	7	7	0000	0000	00	000	003	25	000	200	1	1	0000	00	000	0000	00	00	0	0	0	0
103	0012	1	01	162	1	2	1 1200	100	1300	7	2	0400	1100	03	130	016	01	000	200	1	1	1100	03	130	0000	40	00	1	1	0	0
103	0012	1	01	163	1	2	1 1900	120	1400	7	5	0000	0000	10	160	029	01	200	210	1	1	0200	10	160	0500	10	00	1	1	2	0
103	0012	1	01	164	1	1	1 1600	130	1400	7	7	0000	0000	00	000	002	25	000	200	1	1	0000	00	000	0000	00	00	0	0	0	0
103	0012	1	01	164	2	2	1 1600	130												1	1	0000	00	000	0000	00	00	0	0	0	0
103	0012	1	01	165	1	1	1 1200	100	1300	7	5	0900	1000	03	000	019	01	020	205	1	1	1000	03	000	0200	20	00	1	1	0	0
103	0012	1	01	166	1	1	1 1400	100	1400	7	5	0900	0000	09	130	016	01	000	200	1	1	0900	09	130	0000	20	00	1	1	0	0
103	0012	1	01	167	1	2	1 0000	100	1900	7	2	0900	1200	09	000	016	01	170	225	1	1	1200	09	000	0200	40	01	1	1	2	2
103	0012	1	01	167	2	2	1 0000	200																							
103	0012	1	01	168	1	1	1 1300	100	1400	7	5	0400	0000	25	110	017	01	000	200	1	1	0000	05	110	0400	20	00	1	1	0	0
103	0012	1	01	169	1	1	1 1500	104	1900	7	5	0900	0300	19	170	045	01	000	200	1	1	0300	19	170	0600	12	00			0	0
103	0012	1	01	170	1	1	1 1100	200	1300	7	5	1000	0000	05	160	020	01	000	200	1	1	0000	05	160	0700	12	00	1	1	0	0
103	0012	1	01	171	1	1	1 1100	222	1300	7	5	0000	0600	07	140	004	01	000	200	1	1	0600	07	140	0900	12	00	1	1	0	0
103	0012	1	01	172	1	1	1 1100	222	1900	7	7	0000	0000	00	000	007	02	000	200	1	1	0000	00	000	0000	00	00	0	0	0	0
103	0012	1	01	173	1	2	1 0640	231	3000	7	5	1900	1400	25	190	105	01	000	200	1	1	1400	25	190	0000	12	00	1	1	0	0
103	0012	1	01	174	1	1	1 2030	320	4900	0	5	2000	2000	35	140	175	01	000	200	1	1	2000	35	140	1000	10	00	1	1	0	0
103	0012	1	01	175	1	2	1 3000	160	4000	0	5	2000	2900	35	140	210	01	000	200	1	1	2900	35	140	1200	10	00	1	1	0	0
103	0012	1	01	176	1	1	1 2200	070	4900	0	5	2000	1700	30	130	100	01	000	200	1	1	1700	30	130	1200	10	00	1	1	0	0

[illegible]

Table B2

Vegetation Structure Data, Data Collection Point P3-02

DATA SHEET 1																			
BR BRANCHING										STEM									
STEM BRANCHING										FOLIAGE									
S U P										S U P									
L C										L C									

PIMA FOREST SITE, PANAMA CANAL ZONE

USDA DATA COLLECTION POINT P3-02, 21 SEP 64

GEOGRAPHIC COORDS LAT 09 DEG 52' 14" N, LONG 079 DEG 56' 47" SEC W

AND MAP NO. 4543 IV SM, SATUN LANG. SCALE 1/25,000. NIT GRID COORD 12041004

100	0013	1	01	001	1	1	1	0000	000	0070	3	2	0015	0000	00	000	001	25	000	000	1	2	0000	00	000	0000	10	33	1	1	0	0	
100	0013	1	01	002	1	1	1	1	0000	000	0070	3	5	0040	0030	01	000	001	23	000	070	1	1	0030	01	000	0000	12	25	1	1	0	0
100	0013	1	01	003	1	1	1	1	0000	041	0120	4	5	0050	0000	01	170	001	01	000	120	1	1	0000	01	170	0000	12	34	1	1	0	0
100	0013	1	01	004	1	1	1	1	0170	007	0110	4	2	0030	0105	01	000	002	01	000	110	1	1	0105	01	000	0014	10	50	1	1	0	0
100	0013	1	01	005	1	1	1	1	0120	000	0105	4	2	0150	0000	01	120	002	01	000	105	1	1	0000	01	120	0070	20	10	1	1	0	0
100	0013	1	01	006	1	1	1	1	0100	000	0140	4	5	0040	0000	01	190	001	01	000	100	1	1	0000	01	190	0000	12	30	1	1	0	0
100	0013	1	01	007	1	1	1	1	0200	043	0140	4	5	0020	0000	01	100	002	01	035	195	1	1	0000	01	100	0030	10	33	1	1	0	0
100	0013	1	01	008	1	1	1	1	0170	041	0195	4	5	0080	0000	01	120	001	01	000	195	1	1	0000	01	120	0000	12	31	1	1	0	0
100	0013	1	01	009	1	1	1	1	0140	100	0110	4	5	0050	0000	01	170	002	01	000	110	1	1	0000	01	170	0000	12	30	1	1	0	0
100	0013	1	01	010	1	1	1	1	0100	105	0120	4	5	0070	0000	01	090	001	01	000	120	1	1	0000	01	090	0000	10	33	1	1	0	0
100	0013	1	01	011	1	1	1	1	0120	042	0120	4	2	0070	0000	01	120	002	01	000	120	1	1	0000	01	120	0000	24	10	1	1	0	0
100	0013	1	01	012	1	1	1	1	0100	094	0190	4	2	0240	0040	01	120	002	00	000	190	1	1	0040	01	120	0100	40	20	1	1	0	0
100	0013	1	01	013	1	1	1	1	0200	007	0120	4	2	0200	0040	01	120	002	02	000	120	1	1	0000	01	120	0000	40	20	1	1	0	0
100	0013	1	01	014	1	1	1	1	0110	014	0180	4	5	0000	0000	01	090	001	01	010	120	1	1	0000	01	090	0000	12	30	1	1	0	0
100	0013	1	01	015	1	1	1	1	0200	020	0170	4	2	0200	0000	01	100	002	07	000	170	1	1	0000	01	100	0000	30	16	1	1	0	0
100	0013	1	01	016	1	1	1	1	0200	001	0190	4	2	0200	0000	02	150	002	12	000	190	1	1	0000	02	150	0070	70	33	1	1	0	0
100	0013	1	01	017	1	1	1	1	0240	000	0105	4	5	0050	0000	01	100	001	01	000	105	1	1	0000	01	100	0000	09	35	1	1	0	0
100	0013	1	01	018	1	1	1	1	0200	004	0160	4	5	0050	0000	01	120	001	01	000	160	1	1	0000	01	120	0000	10	33	1	1	0	0
100	0013	1	01	019	1	1	1	1	0200	003	0105	4	5	0025	0000	01	170	001	01	000	105	1	1	0000	01	170	0010	10	33	1	1	0	0
100	0013	1	01	020	1	1	1	1	0300	004	0130	4	2	0100	0000	01	120	001	04	000	130	1	1	0000	01	120	0000	30	11	1	1	0	0
100	0013	1	01	021	1	1	1	1	0300	045	0130	4	2	0100	0000	01	110	002	01	000	160	1	1	0000	01	110	0070	20	16	1	1	0	0
100	0013	1	01	022	1	1	1	1	0200	010	0190	4	2	0040	0000	01	170	002	01	000	190	1	1	0000	01	170	0040	40	22	1	1	0	0
100	0013	1	01	023	1	1	1	1	0400	034	0220	5	5	0060	0110	01	170	002	01	000	200	1	1	0110	01	170	0040	12	25	1	1	0	0
100	0013	1	01	024	1	1	1	1	0400	047	0240	5	5	0100	0110	02	160	003	01	000	200	1	1	0110	02	160	0040	30	64	1	1	0	0
100	0013	1	01	025	1	1	1	1	0300	020	0400	5	5	0100	0240	01	160	002	01	000	200	1	1	0240	01	160	0000	12	30	1	1	0	0
100	0013	1	01	026	1	1	1	1	0440	009	0220	5	5	0100	0100	01	110	002	21	000	200	1	1	0100	01	110	0040	12	30	1	1	0	0
100	0013	1	01	027	1	1	1	1	0400	072	0270	5	5	0100	0160	01	120	002	01	000	200	1	1	0160	01	120	0040	09	35	1	1	0	0
100	0013	1	01	028	1	1	1	1	0400	006	0230	5	5	0100	0100	01	110	002	01	000	200	1	1	0100	01	110	0000	21	35	1	1	0	0
100	0013	1	01	029	1	2	1	1	0200	114	0450	5	5	0250	0250	02	140	004	01	035	220	1	1	0250	02	140	0100	12	35	1	1	2	0
100	0013	1	01	030	2	2	1	1	0150	070																							
100	0013	1	01	031	1	1	1	1	0100	115	0300	5	7	0100	0000	00	000	004	01	000	200	1	1	0000	00	000	0000	00	00	0	0	0	0
100	0013	1	01	032	1	1	1	1	0370	126	0450	5	2	0300	0320	02	120	004	01	000	200	1	1	0320	02	120	0100	40	20	1	1	0	0
100	0013	1	01	033	1	1	1	1	0300	132	0320	5	5	0150	0240	01	120	002	01	000	200	1	1	0240	01	120	0000	12	30	1	1	0	0
100	0013	1	01	034	1	1	1	1	0300	104	0300	5	5	0150	0170	01	110	002	01	000	200	1	1	0170	01	110	0070	12	30	1	1	0	0
100	0013	1	01	035	1	1	1	1	0400	100	0250	5	5	0120	0150	01	100	002	01	000	200	1	1	0150	01	100	0040	12	30	1	1	0	0
100	0013	1	01	036	1	1	1	1	0420	106	0370	5	5	0200	0190	01	090	002	01	035	210	1	1	0190	01	090	0000	10	35	1	1	0	0
100	0013	1	01	037	1	1	1	1	0400	200	0200	5	5	0150	0240	01	110	002	01	000	200	1	1	0240	01	110	0000	12	30	1	1	0	0
100	0013	1	01	038	1	1	1	1	0200	105	0250	5	5	0100	0160	01	120	002	01	000	200	1	1	0160	01	120	0000	21	35	1	1	0	0
100	0013	1	01	039	1	1	1	1	0400	244	0250	5	5	0120	0140	01	140	002	01	000	200	1	1	0140	01	140	0000	12	30	1	1	0	0
100	0013	1	01	040	2	2	1	1	0400	254	0450	5	5	0150	0105	02	150	004	01	000	200	1	1	0105	02	150	0000	00	25	1	1	2	0
100	0013	1	01	041	2	2	1	1	0300	243																							
100	0013	1	01	042	1	1	1	1	0310	265	0240	5	5	0100	0190	02	100	002	01	000	200	1	1	0190	02	100	0040	40	20	1	1	0	0
100	0013	1	01	043	1	1	1	1	0310	271	0250	5	5	0100	0130	01	100	002	01	000	200	1	1	0130	01	100	0040	12	30	1	1	0	0
100	0013	1	01	044	1	1	1	1	0350	271	0400	5	5	0120	0400	02	120	003	01	000	200	1	1	0400	02	120	0100	20	30	1	1	0	0
100	0013	1	01	045	1	1	1	1	0400	206	0300	5	5	0150	0110	01	100	002	01	000	200	1	1	0110	01	100	0000	12	33	1	1	0	0
100	0013	1	01	046	1	1	1	1	0410	307	0210	5	5	0070	0160	01	190	002	01	000	200	1	1	0160	01	190	0000	10	33	1	1	0	0
100	0013	1	01	047	1	1	1	1	0340	308	0240	5	5	0100	0190	01	100	002	01	000	200	1	1	0190	01	100	0000	25	30	1	1	0	0
100	0013	1	01	048	1	1	1	1	0390	345	0240	5	5	0100	0130	01	120	001	01	000	200	1	1	0130	01	120	0000						

Table 22 (Continued)

[illegible]

DATA SHEET 2														
C	S	D	S	I	L	L	D	C	A	SP	C	S	MT	MADIT
U	I	A	M	T	I	I	A	I	J	O	T	T		
N	T	A	P	E	N	N	T	N	Z	T	L	T		
T	S	A	L	N	E	S	A	N	I	O	O	O		
R	S	P	N	N	O	N	N	O	U	N	O	O		
V	O	P	O	O	O	O	O	O	T	N	O	O		
105	0015	1	61	095	2	2	2	0290	105	0	0	0		
105	0013	1	61	047	2	2	2	0260	101					
105	0013	1	61	067	2	2	2	0299	100	0			1	000 070
103	0013	1	61	081	2	2	2	1100	010	0			3	000 340
103	0015	1	01	005	2	2	2	0030	120	0			3	100 160

Comments:

Vegetation Structure Data, Data Collection Point P3-03

(Copy 1 made)

Table 23 (Continued)

2014-2015 3

COUNTRY	ITY	DATA	SHP	ITEN	LINEN	LINEN	DATA	DO	AZ	H	H	C	C	ON GRADING				OTEN				OTEN GRADING				POLICE				CUP	CUP	
														HT	DI	AN	DI	AN	HT	DI	AN	HT	DI	AN	HT	DI	AN	HT	DI			AN
103	0014	1	01	064	1	2	1	0140	00	1100	6	9	0000	0160	03	175	012	01	120	000	1	1	0300	03	175	0100	21	30	1	1	0	0
103	0014	1	01	064	2	2	1	0400	217											1	1	0400	01	110	0100	40	33	1	1	0	0	
103	0014	1	01	067	1	1	1	0000	074	1200	6	9	0000	0300	01	110	009	01	000	000	1	1	0300	01	110	0100	40	33	1	1	0	0
103	0014	1	01	067	1	1	1	0000	116	0000	6	9	0000	0300	01	110	004	01	000	000	1	1	0400	01	110	0100	40	33	1	1	0	0
103	0014	1	01	069	1	1	1	0000	120	0000	6	9	0400	0270	03	140	009	01	000	010	1	1	0370	03	140	0000	40	33	1	1	0	0
103	0014	1	01	070	1	1	1	0001	100	0000	6	2	0300	0400	02	110	004	01	000	000	1	1	0410	02	110	0100	40	33	1	1	0	0
103	0014	1	01	071	1	1	1	0000	100	0730	6	2	0300	0200	02	110	004	01	000	000	1	1	0400	02	110	0100	40	33	1	1	0	0
103	0014	1	01	072	1	1	1	0000	340	0000	7	9	0400	0300	03	120	010	01	000	000	1	1	0300	03	120	0000	30	00	1	1	0	0
103	0014	1	01	073	1	1	1	0000	330	0000	7	7	0000	0000	00	000	004	01	000	000	1	1	0000	00	000	0000	00	00	1	1	0	0
103	0014	1	01	074	1	1	1	0000	300	0000	7	7	0000	0000	00	000	007	04	000	000	1	1	0000	00	000	0000	00	00	1	1	0	0
103	0014	1	01	075	1	1	1	0000	304	0000	7	9	1000	0000	00	170	000	01	000	000	1	1	0000	00	170	0000	10	00	1	1	0	0
103	0014	1	01	076	1	1	1	1000	344	1000	7	9	0000	0400	00	160	001	01	000	000	1	1	0400	00	160	0300	10	00	1	1	0	0
103	0014	1	01	077	1	1	1	1100	010	1400	7	9	0000	0400	03	120	010	01	000	000	1	1	0400	03	120	0000	10	00	1	1	0	0
103	0014	1	01	078	1	1	1	1300	007	0400	7	9	1000	0400	04	150	009	01	000	000	1	1	0400	04	150	0100	10	00	1	1	0	0
103	0014	1	01	079	1	1	1	1100	040	1300	7	9	0400	0700	02	100	010	01	000	000	1	1	0700	02	100	0100	40	00	1	1	0	0
103	0014	1	01	080	1	1	1	0070	040	1003	7	2	1000	0000	00	140	000	01	000	000	1	1	0000	00	140	0000	00	01	1	1	0	0
103	0014	2	01	081	1	1	1	0070	104	0000	7	9	1300	1000	03	160	003	01	000	000	1	1	1000	03	160	0000	10	00	1	1	0	0
103	0014	1	01	082	1	2	1	0000	100	1400	7	2	1400	1200	04	130	013	01	000	000	1	1	1200	04	130	0400	00	01	1	1	0	0
103	0014	1	01	083	1	1	1	1100	100	0000	7	9	1200	0400	00	120	047	01	000	000	1	1	0400	00	120	0000	10	00	1	1	0	0
103	0014	1	01	084	1	1	1	1300	100	1000	7	7	0000	0000	00	000	000	01	000	000	1	1	0000	00	000	0000	00	00	1	1	0	0
103	0014	1	01	085	1	1	1	1300	200	1000	7	9	0000	0000	00	100	000	01	000	000	1	1	0000	00	100	0000	00	00	1	1	0	0
103	0014	1	01	086	1	1	1	1000	040	1300	7	9	0000	0400	03	000	010	01	000	000	1	1	0400	03	000	0000	10	33	1	1	0	0
103	0014	1	01	087	1	1	1	0000	003	1000	7	9	1000	0000	10	160	000	01	000	000	1	1	0000	10	160	0000	10	00	1	1	0	0
103	0014	1	01	088	1	1	1	0000	003	1000	7	7	0000	0000	00	000	000	00	000	000	1	1	0000	00	000	0000	00	00	1	1	0	0
103	0014	1	01	089	1	1	1	1300	000	1000	7	9	0000	1100	02	100	017	01	000	000	1	1	1100	02	100	0000	10	00	1	1	0	0
103	0014	1	01	090	1	1	1	1200	001	0000	7	9	1000	0400	03	130	000	01	000	000	1	1	0400	03	130	0400	10	00	1	1	0	0
103	0014	1	01	091	1	1	1	1140	004	0300	7	9	1200	0000	00	160	100	01	000	000	1	1	0000	00	160	0000	10	00	1	1	0	0
103	0014	1	01	092	1	1	1	0700	000	1000	7	9	0700	0400	03	100	010	01	000	000	1	1	0400	03	100	0000	10	00	1	1	0	0
103	0014	1	01	093	1	1	1	0140	033	1400	7	9	0000	0400	00	130	010	01	000	000	1	1	0400	00	130	0400	10	00	1	1	0	0

DATA SHEET 2

C	S	D	S	I	L	D	C	A	S	C	R	H
C	I	A	N	T	I	A	E	Z	P	T	T	A
C	I	T	P	E	E	S	N	I	T	R	T	B
C	N	A	N	N	N	S	S	M	S	S	O	N
C	O	T	O	O	O	S	M	M	M	F	F	B
C	N	A	N	O	N	S	M	M	M	F	F	B
C	O	T	O	O	O	S	M	M	M	F	F	B
C	N	A	N	O	N	S	M	M	M	F	F	B
C	O	T	O	O	O	S	M	M	M	F	F	B
C	N	A	N	O	N	S	M	M	M	F	F	B
C	O	T	O	O	O	S	M	M	M	F	F	B
C	N	A	N	O	N	S	M	M	M	F	F	B
C	O	T	O	O	O	S	M	M	M	F	F	B
C	N	A	N	O	N	S	M	M	M	F	F	B
C	O	T	O	O	O	S	M	M	M	F	F	B
C	N	A	N	O	N	S	M	M	M	F	F	B
C	O	T	O	O	O	S	M	M	M	F	F	B
C	N	A	N	O	N	S	M	M	M	F	F	B
C	O	T	O	O	O	S	M	M	M	F	F	B
C	N	A	N	O	N	S	M	M	M	F	F	B
C	O	T	O	O	O	S	M	M	M	F	F	B
C	N	A	N	O	N	S	M	M	M	F	F	B
C	O	T	O	O	O	S	M	M	M	F	F	B
C	N	A	N	O	N	S	M	M	M	F	F	B
C	O	T	O	O	O	S	M	M	M	F	F	B
C	N	A	N	O	N	S	M	M	M	F	F	B
C	O	T	O	O	O	S	M	M	M	F	F	B
C	N	A	N	O	N	S	M	M	M	F	F	B
C	O	T	O	O	O	S	M	M	M	F	F	B
C	N	A	N	O	N	S	M	M	M	F	F	B
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COMMENT

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Vegetation Structure Data, Data Collection Point P3-04

(Cont 1 of 4)

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[illegible]

DATA SHEET 2														COMMENTS
C O U N T R Y	S I T E	D A T A	S A M P L E	I T E M	L I N E	L I N E	S A M P L E	S A M P L E	A Z I M U T H	S P E C T R O M E T R Y	C O N T E N T	R Y T H M P E	N A B I T Y	
103	0015	1	61	031	2	2	2	0350	035	1	0	0	0	
103	0015	1	61	034	2	2	2	0130	098	0	1	0	0	
103	0015	1	61	070	2	2	2	0000	344	1	0	0	0	

Table B1

Vegetation Structure Data, Data Collection Point P4-01

DATA SHEET 1																													
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Table 75 (Continued)

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															N	D	A	N		N	D	A	N	N	D	A	N			N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N	D	A	N	N

DATA SHEET 2													
G	S	D	S	I	L	D	D	C	A	SP	C	RT	WABIT
C	T	T	P	E	I	O	I	E	Z	P	T		
U	E	A	L	M	N	N	N	N	I	T	T		
N									M	S	S	Y	
T									U	S	S	P	
R	O	P	O	O	O	H	R	M	M	M	O	O	D
103	0016	1	01	022	2	2	2	0300	114	0	0	0	000
103	0016	1	02	049	2	2	2	0409	108	0	0	0	000
103	0016	1	03	059	2	2	2	0130	127	7	0	0	000
103	0016	1	04	094	2	2	2	0150	135	5	0	0	000
103	0016	1	05	003	2	2	2	0430	142	2	0	0	000
103	0016	1	06	070	2	2	2	0029	234	6	0	0	110
103	0016	1	07	072	3	3	2	0200	279	5	0	0	1 190
103	0016	1	08	000	2	2	2	0390	076	6	0	0	3 070
103	0016	1	09	091	2	2	2	1900	732	2	0	0	3 000

COMMENT:

Vegetation Structure Data, Data Collection Point #4-06

SALEMA FOREST SITE, PANAMA CANAL ZONE
 NEW DATA COLLECTION POINT PA-04, 14 OCT 64
 STATION'S GEOD. LAT 09 DEG 04 MIN 10 SEC N, LONG 079 DEG 04 MIN 23 SEC W
 AND MAP NO. 0001-11-00- PANAMA. SCALE 1/25,000. NIL GRID COORD 8090000

(Cont. lined)

Table 26 (Continued)

DATA SHEET 1																																		
C O U N T Y	S T A T E	D I S T R I C T	S E C T I O N	L O C A L I T Y	L O C A L I T Y	D I S T R I C T	D I S T R I C T	A R E A	H I G H W A Y	H I G H W A Y	C O U N T Y	C O U N T Y	ON BRANCHING				STON				STON BRANCHING				POLIAGE				C O U N T Y	C O U N T Y				
													M	D	A	O	M	A	O	D	H	M	D	A	L	L	M	V			O	O	P	P
103	0001	1	01	000	1	2	1	1000	100	2100	7	9	0400	1000	00	140	100	01	000	000	1	1	1000	00	140	1000	04	40	0	1	0	0		
103	0001	1	01	001	1	1	1	0000	104	1000	7	9	0700	0700	14	100	010	01	040	000	1	1	0700	14	100	0000	12	40	0	1	0	0		
103	0001	1	01	002	1	1	1	0000	104	1000	7	7	0000	0000	00	000	004	01	000	000	1	1	0000	00	000	0000	00	00	0	0	0	0		
103	0001	1	01	003	1	1	1	0400	107	1000	7	9	0500	0400	10	100	000	01	000	000	1	1	0400	10	100	0000	12	40	0	1	0	0		
103	0001	1	01	004	1	1	1	1000	107	1300	7	9	0500	0700	00	100	013	01	000	000	1	1	0700	00	100	0100	00	00	0	1	0	0		
103	0001	1	01	005	1	1	1	1200	107	1400	7	9	0500	0400	00	100	013	01	000	000	1	1	0400	00	100	0100	14	00	0	1	0	0		
103	0001	1	01	006	1	1	1	1200	107	1400	7	9	0500	1100	07	100	000	01	000	000	1	1	1100	07	100	0000	14	00	0	1	0	0		
103	0001	1	01	007	1	1	1	0000	171	1000	7	9	0700	0710	04	100	013	01	000	000	1	1	0700	04	100	0000	14	00	0	1	0	0		
103	0001	1	01	008	1	1	1	1200	109	1300	7	9	0400	0000	00	100	017	01	000	000	1	1	0000	00	100	0000	40	00	0	1	0	0		
103	0001	1	01	009	1	1	1	1100	100	1400	7	9	0400	0700	04	100	010	01	000	040	1	1	0700	04	100	0000	40	00	0	1	0	0		

		DATA SHEET 2																						
C O U N T Y	S T A T E	D I S T R I C T	S E C T I O N	L O C A L I T Y	L O C A L I T Y	D I S T R I C T	D I S T R I C T	A R E A	H I G H W A Y	H I G H W A Y	C O U N T Y	C O U N T Y	ST HABIT											
													M	D	A	O	M	A	O	D				
																					M	D	A	O
103	0001	1	01	011	2	2	2	0310	120	0	0	0	0	000	000	000	000							
103	0001	1	01	012	2	2	2	0340	120	0	0	0	0	000	000	000	000							
103	0001	1	01	013	2	2	2	0350	104	0	0	0	0	000	000	000	000							
103	0001	1	01	014	2	2	2	0420	200	0	0	0	0	000	000	000	000							
103	0001	1	01	017	2	2	2	0410	211	0	0	0	0	000	000	000	000							
103	0001	1	01	018	2	2	2	0210	239	0	0	0	0	000	000	000	000							
103	0001	1	01	019	2	2	2	0340	232	0	0	0	0	000	000	000	000							
103	0001	1	01	020	2	2	2	0110	197	0	0	0	0	000	000	000	000							
103	0001	1	01	021	2	2	2	0300	274	0	0	0	0	000	000	000	000							
103	0001	1	01	022	2	2	2	0340	277	0	0	0	0	000	000	000	000							
103	0001	1	01	023	2	2	2	0430	267	0	0	0	0	000	000	000	000							
103	0001	1	01	024	2	2	2	0370	266	0	0	0	0	000	000	000	000							
103	0001	1	01	025	2	2	2	0400	260	0	0	0	0	000	000	000	000							
103	0001	1	01	062	2	2	2	0275	294	0	0	0	0	000	000	000	000							
103	0001	1	01	069	2	2	2	0500	306	0	0	0	0	1	000	000	000							
103	0001	1	01	066	2	2	2	0525	305	0	0	0	0	1	000	000	000							
103	0001	1	01	070	2	2	2	0600	005	0	0	0	0	3	200	400	400							
103	0001	1	01	071	2	2	2	0630	360	0	1	0	0	0	000	000	000							
103	0001	1	01	080	2	2	2	1000	120	0	0	0	0	3	400	000	000							

COMMENTS

NAYA PLANT
NAYA PLANT

Vegetation Structure Data. Data Collection Point 74-07

[illegible]

BALBOA FOREST SITE, PANAMA CANAL ZONE
 WGS DATA COLLECTION POINT 84-07, 14 OCT 84
 GEODATPAC GEODAT LAY 01 008 04 MIN 17 008 N, LONG 079 008 04 MIN 25 008 W
 AND MAP WGS-8303 11 SW, PARADOX, SCALE 1/25,000, NIL ARID 0000 2051000

100	0000	1	01	001	1	1	1	0000	000	0000	1	2	0000	0000	00	000	001	22	0000	000	1	1	0000	00	000	0034	00	00	2	1	0	0	0
100	0000	1	01	002	1	1	1	0000	000	0000	2	5	0000	0000	00	000	001	22	0000	000	1	1	0000	00	000	0066	12	00	2	1	0	0	0
100	0000	1	01	003	1	1	1	0000	000	0000	3	9	0000	0000	00	000	001	22	0000	000	1	1	0000	00	000	0000	10	00	2	1	0	0	0
100	0000	1	01	004	1	1	1	0000	041	0120	4	5	0000	0040	01	140	001	01	000	000	1	1	0040	01	140	0000	04	00	2	1	0	0	0
100	0000	1	01	005	1	1	1	0000	0000	0100	4	5	0000	0000	01	000	002	01	000	000	1	1	0000	01	140	0010	10	00	2	1	0	0	0
100	0000	1	01	006	1	1	1	0000	0000	0100	4	2	0000	0000	01	100	001	01	000	000	1	1	0000	01	100	0000	00	00	2	1	0	0	0
100	0000	1	01	007	1	1	1	0000	100	0100	4	5	0000	0000	01	100	001	01	000	000	1	1	0000	01	100	0000	00	00	2	1	0	0	0
100	0000	1	01	008	1	1	1	0000	100	0100	4	5	0000	0000	01	140	001	01	000	000	1	1	0000	01	140	0000	12	00	2	1	0	0	0
100	0000	1	01	009	1	1	1	0000	120	0100	4	5	0000	0000	01	140	001	01	000	000	1	1	0000	01	000	0000	14	00	2	1	0	0	0
100	0000	1	01	010	1	1	1	0000	120	0100	4	5	0000	0000	01	100	001	01	000	000	1	1	0000	01	100	0000	16	00	2	1	0	0	0
100	0000	1	01	011	1	1	1	0000	120	0100	4	5	0000	0000	01	100	001	01	000	000	1	1	0000	01	100	0000	18	00	2	1	0	0	0
100	0000	1	01	012	1	1	1	0000	100	0100	4	2	0000	0000	01	100	001	01	000	000	1	1	0000	01	000	0000	10	00	2	1	0	0	0
100	0000	1	01	013	1	1	1	0000	160	0100	4	2	0000	0000	01	100	001	01	000	000	1	1	0000	01	100	0000	10	00	2	1	0	0	0
100	0000	1	01	014	1	1	1	0000	274	0100	4	5	0000	0000	01	140	001	01	000	000	1	1	0000	01	100	0010	18	00	2	1	0	0	0
100	0000	1	01	015	1	1	1	0000	202	0100	4	5	0000	0000	01	140	001	01	000	000	1	1	0000	01	100	0000	18	00	2	1	0	0	0
100	0000	1	01	016	1	1	1	0000	240	0100	4	5	0000	0000	01	140	001	01	000	000	1	1	0000	01	100	0000	18	00	2	1	0	0	0
100	0000	1	01	017	1	1	1	0000	240	0110	4	5	0000	0000	01	000	001	01	000	000	1	1	0000	01	000	0000	15	00	2	1	0	0	0
100	0000	1	01	018	1	1	1	0000	200	0100	4	5	0000	0000	01	000	001	01	000	000	1	1	0000	01	100	0000	20	00	2	1	0	0	0
100	0000	1	01	019	1	1	1	0000	100	0100	4	2	0000	0000	01	140	001	01	000	000	1	1	0000	01	140	0000	00	00	2	1	0	0	0
100	0000	1	01	020	1	1	1	0000	160	0100	4	5	0000	0000	01	100	001	01	000	000	1	1	0000	01	100	0000	12	00	2	1	0	0	0
100	0000	1	01	021	1	1	1	0000	040	0110	4	5	0000	0000	01	000	001	01	000	000	1	1	0000	01	000	0040	16	00	2	1	0	0	0
100	0000	1	01	022	1	1	1	0000	000	0100	4	5	0000	0000	01	100	001	01	000	000	1	1	0000	01	000	0010	16	00	2	1	0	0	0
100	0000	1	01	023	1	1	1	0000	100	0100	4	5	0000	0000	01	000	001	01	000	000	1	1	0000	01	000	0000	20	00	2	1	0	0	0
100	0000	1	01	024	1	1	1	0000	100	0100	4	5	0000	0000	01	000	001	01	000	000	1	1	0000	01	000	0000	20	00	2	1	0	0	0
100	0000	1	01	025	1	1	1	0000	110	0100	4	5	0000	0000	01	000	001	01	000	000	1	1	0000	01	000	0000	20	00	2	1	0	0	0
100	0000	1	01	026	1	1	1	0000	100	0100	4	5	0000	0000	01	000	001	01	000	000	1	1	0000	01	000	0000	20	00	2	1	0	0	0
100	0000	1	01	027	1	1	1	0000	140	0100	4	2	0000	0000	01	100	001	01	000	000	1	1	0000	01	100	0000	15	00	2	1	0	0	0
100	0000	1	01	028	1	1	1	0000	140	0100	4	2	0000	0000	01	100	001	01	000	000	1	1	0000	01	100	0000	15	00	2	1	0	0	0
100	0000	1	01	029	1	1	1	0000	100	0100	4	5	0000	0000	01	000	001	01	000	000	1	1	0000	01	100	0000	20	00	2	1	0	0	0
100	0000	1	01	030	1	1	1	0000	130	0110	4	5	0000	0000	01	000	002	01	000	000	1	1	0000	01	100	0000	14	00	2	1	0	0	0
100	0000	1	01	031	1	1	1	0000	141	0120	5	5	0000	0000	01	000	001	01	000	000	1	1	0040	01	200	0000	00	00	2	1	0	0	0
100	0000	1	01	032	1	1	1	0000	141	0120	5	5	0000	0000	01	000	002	01	000	000	1	1	0040	01	200	0000	10	00	2	1	0	0	0
100	0000	1	01	033	1	1	1	0000	174	0400	5	2	0000	0000	01	000	003	01	070	200	1	1	0000	01	070	0000	70	00	2	1	0	0	0
100	0000	1	01	034	1	1	1	0000	200	0270	5	5	0000	0100	01	000	003	01	000	200	1	1	0100	01	000	0000	12	00	2	1	0	0	0
100	0000	1	01	035	1	1	1	0000	200	0260	5	5	0000	0100	01	100	003	01	000	200	1	1	0000	01	000	0000	12	00	2	1	0	0	0
100	0000	1	01	036	1	1	1	0000	700	0300	5	5	0000	0200	01	000	001	01	000	200	1	1	0000	01	100	0000	20	00	2	1	0	0	0
100	0000	1	01	037	1	1	1	0000	100	0230	5	5	0000	0100	01	100	001	01	000	200	1	1	0000	01	100	0000	00	00	2	1	0	0	0
100	0000	1	01	038	1	1	1	0000	200	0200	5	5	0000	0100	01	100	001	01	000	200	1	1	0000	01	100	0000	00	00	2	1	0	0	0
100	0000	1	01	039	1	1	1	0000	200	0200	5	2	0000	0100	01	100	001	01	000	200	1	1	0000	01	100	0000	00	00	2	1	0	0	0
100	0000	1	01	040	1	1	1	0000	200	0200	5	2	0000	0100	01	100	001	01	000	200	1	1	0000	01	100	0000	00	00	2	1	0	0	0
100	0000	1	01	041	1	1	1	0000	200	0200	5	5	0000	0200	01	100	001	01	000	200	1	1	0000	01	100	0000	00	00	2	1	0	0	0
100	0000	1	01	042	1	1	1	0000	240	0200	5	5	0000	0200	01	100	001	01	000	200	1	1	0000	01	100	0000	00	00	2	1	0	0	0
100	0000	1	01	043	1	1	1	0000	240	0200	5	5	0000	0200	01	100	001	01	000	200	1	1	0000	01	100	0000	00	00	2	1	0	0	0
100	0000	1	01	044	1	1	1	0000	200	0270	5	5	0000	0200	01	100	001	01	000	200	1	1	0000	01	100	0000	24	00	2	1	0	0	0
100	0000	1	01	045	1	1	1	0000	240	0200	5	5	0000	0200	01	000	003	01	000	200	1	1	0000	01	000	0000	12	00	2	1	0	0	0
100	0000	1	01	046	1	1	1	0000	240	0200	5	5	0000	0200	01	000	003	01	000	200	1	1	0000	01	000	0000	12	00	2	1	0	0	0
100	0000	1	01	047	1	1	1	0000	270	0200	5	5	0000	0200	01	100	001	01	000	200	1	1	0000	01	000	0000	10	00	2	1	0	0	0
100	0000	1	01	048	1	1	1	0000	200	0200	5	5	0000	0200	01	100	001	01	000	200	1	1	0000	01	000	0000	10	00	2	1	0	0	0
100	0000	1	01	049	1	1	1	0000	290	0200	5	5	0000	0200	01	100	001	01	000	200	1	1	0000	01	000	0000	10	00	2	1	0	0	0
100	0000	1	01	050	1	2	1	0000	200	0																							

(Cont. Listed)

Table 27 (Continued)

DATA SHEET 1																																
COUNTRY	SITE NO	DATA NO	OBS NO	ITEM NO	L1 ID NO	L1 SUB NO	DATA NO	OBS NO	AZIMUTH	HEIGHT	MAG	COR	COR	OR BRANCHING			STON	STON BRANCHING				POLIAGE				GROUP	SUP					
														INT	DIAM	DIAM		INT	DIAM	PTR	INT	DIAM	LOT	LOT	CH			CH	CH			
103	0032	1	01	000	1	1	1	1100	100	1700	7	2	0000	1000	07	100	040	01	000	200	1	1	1000	07	100	0700	60	10	0	1	0	0
103	0032	1	01	001	1	1	1	0230	270	2000	7	2	1700	1600	20	110	090	01	000	200	1	1	1600	20	110	0700	14	40	0	1	0	0
103	0032	1	01	002	1	1	1	0000	263	2400	7	2	1100	1700	07	120	040	01	000	200	1	1	1700	07	120	0600	00	10	0	1	0	0
103	0032	1	01	003	1	1	1	1200	270	1900	7	2	1300	1400	00	110	030	01	000	200	1	1	1400	00	110	0700	00	00	0	1	0	0
103	0032	1	01	004	1	1	1	0700	200	1900	7	2	1100	1310	00	120	030	01	000	200	1	1	1300	00	120	0600	00	00	0	1	0	0
103	0032	1	01	005	1	1	1	1400	217	2100	7	2	1300	1400	00	110	037	01	000	200	1	1	1400	00	110	0700	00	00	0	1	0	0
103	0032	1	01	006	1	1	1	1100	204	2000	7	2	1100	1000	00	110	030	01	000	200	1	1	1000	00	110	0600	00	00	0	1	0	0
103	0032	1	01	007	1	1	1	0700	240	1900	7	2	1000	0000	12	130	020	01	000	200	1	1	0000	12	130	0900	14	20	0	1	0	0
103	0032	1	01	008	1	1	1	0900	207	1700	7	2	1000	1100	07	130	020	01	000	200	1	1	1100	07	130	0900	20	00	0	1	0	0
103	0032	1	01	009	1	1	1	1200	170	1700	7	2	1000	1100	07	100	024	01	000	200	1	1	1100	07	100	0900	00	00	0	1	0	0
103	0032	1	01	010	1	1	1	1400	090	1400	7	2	1100	0754	07	140	020	01	000	200	1	1	0700	07	140	0900	20	10	0	1	0	0
103	0032	1	01	011	1	1	1	1400	011	1400	7	2	0000	0000	00	190	027	01	000	200	1	1	0100	00	160	0900	12	50	0	1	0	0

																DATA SHEET 2			
C O U N T R Y	S I T E	D A T A	S H O P	I T E M	L I N E	L I N E S	D A T A	D I S T R I B	A Z I M U T H	B O Y L R S S M H	C Y T O	S T O	R T	HABIT					
														Y T P	S P R				
103	0032	1	01	027	2	2	2	0900	143	4	0	0	0	0	000	000			
103	0032	1	01	028	2	2	2	0400	149	4	0	0	0	0	000	000			
103	0032	1	01	029	2	2	2	0900	223	1	0	0	0	0	000	000			
103	0032	1	01	073	2	2	2	0900	054	4	0	0	0	0	000	000			
103	0032	1	01	079	2	2	2	0079	191	0	0	0	0	3	000	200			

COMMENTS

Table 25

Vegetation Structure Data, Data Collection Point VO495

DATA SHEET 1										OR BRANCHING		STEM		STEM BRANCHING		FOLIAGE		S U P	
S	O	D	I	L	D	A	M	N	C	H	S	A	S	H	S	L	L	S	U
U	T	T	P	G	T	T	T	T	T										
T	O	L	N	O	O	U	U	L	P	Y	I	I	T	T	I	T	T	O	P
Y	O	P	O	O	M	N	N	S	N	A	A	A	T	U	N	A	M	N	C

PRAN BURI FOREST SITE, THAILAND

HSD DATA COLLECTION POINT VO495, 27 APR 65

GEOGRAPHIC COORD LAY 12 DEG 25 MIN 55 SEC N, LONG 100 DEG 46 MIN 23 SEC E

AND MAP NO. 4945 II, AIRMOB PRAN BURI, SCALE 1/25,000, NIT GRID COORD 640745

122	0450	1	01	001	1	1	1	0000	000	0040	3	1	0020	0000	001	20	1	1	0	0
122	0450	1	01	002	1	1	1	0000	002	0100	4	1	0040	0000	001	01	1	1	0	0
122	0450	1	01	003	1	1	1	0000	013	0140	4	1	0000	0000	001	01	1	1	0	0
122	0450	1	01	004	1	1	1	0000	011	0000	3	1	0040	0000	001	01	1	1	0	0
122	0450	1	01	005	1	1	1	0100	000	0100	4	1	0000	0042	001	01	1	1	0	0
122	0450	1	01	006	1	1	1	0000	017	0000	3	1	0000	0049	001	01	1	1	0	0
122	0450	1	01	007	1	1	1	0000	017	0110	4	1	0000	0010	001	01	1	1	0	0
122	0450	1	01	008	1	1	1	0000	020	0110	4	1	0040	0049	001	01	1	1	0	0
122	0450	1	01	009	1	1	1	0000	020	0100	4	1	0120	0040	002	01	1	1	0	0
122	0450	1	01	010	1	1	1	0000	023	0100	4	1	0100	0040	002	01	1	1	0	0
122	0450	1	01	011	1	2	1	0010	047	0100	4	1	0000		001	00	1	1	0	2
122	0450	1	01	012	1	1	1	0170	047	0000	3	1	0000	0016	001	01	1	1	0	0
122	0450	1	01	013	1	1	1	0000	050	0070	3	1	0000		001	04	1	1	0	0
122	0450	1	01	014	1	1	1	0000	079	0140	4	1	0040	0010	002	01	1	1	0	0
122	0450	1	01	015	1	1	1	0010	000	0160	4	1	0100	0000	001	01	1	1	0	0
122	0450	1	01	016	1	1	1	0000	102	0100	4	1	0000	0010	001	01	1	1	0	0
122	0450	1	01	017	1	1	1	0000	111	0100	4	1	0000	0000	001	01	1	1	0	0
122	0450	1	01	018	1	1	1	0000	119	0170	4	1	0100	0040	002	01	1	1	0	0
122	0450	1	01	019	1	1	1	0100	127	0100	4	1	0000	0049	001	01	1	1	0	0
122	0450	1	01	020	1	1	1	0140	104	0100	4	1	0000		001	00	1	1	0	0
122	0450	1	01	021	1	1	1	0000	144	0100	4	1	0000	0010	001	01	1	1	0	0
122	0450	1	01	022	1	1	1	0100	144	0000	3	1	0040		001	02	1	1	0	0
122	0450	1	01	023	1	1	1	0100	144	0000	3	1	0100		001	04	1	1	0	0
122	0450	1	01	024	1	1	1	0000	150	0140	4	1	0000	0000	001	01	1	1	0	0
122	0450	1	01	025	1	1	1	0000	166	0000	3	1	0100		001	00	1	1	0	0
122	0450	1	01	026	1	1	1	0100	181	0100	4	1	0040		001	04	1	1	0	0
122	0450	1	01	027	1	1	1	0100	191	0000	3	1	0000	0040	001	01	1	1	0	0
122	0450	1	01	028	1	1	1	0000	194	0000	3	1	0040		001	02	1	1	0	0
122	0450	1	01	029	1	1	1	0000	199	0170	4	1	0100	0012	001	01	1	1	0	0
122	0450	1	01	030	1	1	1	0170	206	0100	4	1	0100		001	06	1	1	0	0
122	0450	1	01	031	1	2	1	0010	210	0100	4	1	0000	0000	001	01	1	1	0	2
122	0450	1	01	032	1	1	1	0000	210	0110	4	1	0000	0001	001	01	1	1	0	0
122	0450	1	01	033	1	1	1	0100	201	0100	4	1	0000	0049	001	01	1	1	0	0
122	0450	1	01	034	1	1	1	0000	206	0100	4	1	0100		001	03	1	1	0	0
122	0450	1	01	035	1	1	1	0100	206	0000	3	1	0000	0000	001	01	1	1	0	0
122	0450	1	01	036	1	1	1	0070	274	0170	4	1	0040	0040	002	01	1	1	0	0
122	0450	1	01	037	1	1	1	0140	279	0170	4	1	0100	0010	001	01	1	1	0	0
122	0450	1	01	038	1	1	1	0000	284	0140	4	1	0100		002	04	1	1	0	0
122	0450	1	01	039	1	1	1	0000	216	0100	4	1	0100	0000	001	01	1	1	0	0
122	0450	1	01	040	1	1	1	0000	289	0000	3	1	0100		001	10	1	1	0	0
122	0450	1	01	041	1	1	1	0140	288	0100	4	1	0100	0010	002	01	1	1	0	0
122	0450	1	01	042	1	1	1	0010	293	0100	4	1	0100		002	03	1	1	0	0
122	0450	1	01	043	1	1	1	0000	016	0100	4	1	0000	0000	001	01	1	1	0	0
122	0450	1	01	044	1	1	1	0000	019	0000	3	1	0000	0070	002	01	1	1	0	0
122	0450	1	01	045	1	1	1	0000	027	0000	3	1	0100	0000	002	01	1	1	0	0
122	0450	1	01	046	1	1	1	0000	000	0000	3	1	0000	0100	003	01	1	1	0	0
122	0450	1	01	047	1	1	1	0000	001	0000	3	1	0000	0000	002	01	1	1	0	0
122	0450	1	01	048	1	1	1	0000	001	0000	3	1	0000	0100	004	01	1	1	0	0
122	0450	1	01	049	1	1	1	0000	074	0000	3	1	0000	0000	002	01	1	1	0	0
122	0450	1	01	050	1	1	1	0000	101	0000	3	1	0100		002	03	1	1	0	0
122	0450	1	01	051	1	1	1	0100	101	0000	3	1	0040	0000	002	01	1	1	0	0
122	0450	1	01	052	1	1	1	0000	119	0000	3	1	0100	0070	002	01	1	1	0	0
122	0450	1	01	053	1	1	1	0000	120	0000	3	1	0100	0000	002	01	1	1	0	0
122	0450	1	01	054	1	1	1	0000	124	0400	3	1	0100	0000	004	01	1	1	0	0
122	0450	1	01	055	1	1	1	0000	126	0000	3	1	0100	0000	002	01	1	1	0	0
122	0450	1	01	056	1	1	1	0000	124	0400	3	1	0170	0100	002	01	1	1	0	0
122	0450	1	01	057	1	1	1	0000	149	0070	3	1	0100	0010	002	01	1	1	0	0
122	0450	1	01	058	1	1	1	0000	150	0000	3	1	0100	0000	001	01	1	1	0	0
122	0450	1	01	059	1	1	1	0000	164	0000	3	1	0100	0000	002	01	1	1	0	0
122	0450	1	01	060	1	1	1	0000	170	0000	3	1	0100	0100	002	01	1	1	0	0
122	0450	1	01	061	1	1	1	0000	170	0000	3	1	0100	0000	002	01	1	1	0	0
122	0450	1	01	062	1	1	1	0000	197	0000	3	1	0100	0000	002	01	1	1	0	0
122	0450	1	01	063	1	1	1	0000	201	0210	3	1	0100	0000	000	01	1	1	0	0
122	0450	1	01	064	1	1	1	0000	219	0210	3	1	0000	0000	001	01	1	1	0	0
122	0450	1	01	065	1	1	1	0000	219	0000	3	1	0100		001	09	1	1	0	0
122	0450	1	01	066	1	2	1	0010	227	0000	3	1	0110	0000	001	01	1	1	0	2
122	0450	1	01	067	1	1	1	0000	243	0000	3	1	0100		002	03	1	1	0	0
122	0450	1	01	068	1	1	1	0000	244	0210	3	1	0040	0000	001	01	1	1	0	0
122	0450	1	01	069	1	1	1	0040	244	0000	3	1	0100	0000	002	01	1	1	0	0
122	0450	1	01	070	1	1	1	0170	254	0000	3	1	0100	0070	002	01	1	1	0	0
122	0450	1	01	071	1	1	1	0100	264	0210	3	1	0100	0000	002	01	1	1	0	0
122	0450	1	01	072	1	1	1	0000	260	0000	3	1	0100	0000	000	01	1	1	0	0
122	0450	1	01	073	1	1	1	0000	171	0000	3	1	0140	0000	002	01	1	1	0	0
122	0450	1	01	074	1	1	1	0000	190	0000	3	1	0000	0000	002	01	1	1	0	0
122	0450	1	01	075	1	1	1	0000	279	0000	3	1	0100	0100	002	01	1	1	0	0
122	0450	1	01	076	1	1	1	0000	281	0200	3	1	0100		002	06	1	1	0	0
122	0450	1	01	077	1	1														

Table 25 (Continued)

DATA SHEET 1														
COUNTY	CITY	DISTRICT	SCHOOL	LINE	LINE	DISTRICT	DISTRICT	ADDRESS	ADDRESS	ADDRESS	ADDRESS	ADDRESS	ADDRESS	
Y	O	P	O	O	O	N	N	M	T	O	M	A	OR	
132	0490	1	01	000	1	1	0340	007	0000	9	1	0110	0010	
132	0490	1	01	001	1	2	1	0200	010	1000	7	1	0000	0000
132	0490	1	01	002	1	1	1	0700	000	0000	7	1	0000	0000
132	0490	1	01	003	1	1	1	0610	000	0000	7	1	0000	0000
132	0490	1	01	004	1	1	1	0070	007	1000	6	1	0400	0000
132	0490	1	01	005	1	1	1	0000	000	1000	6	1	0000	0000
132	0490	1	01	006	1	1	1	0000	000	1100	6	1	0000	0000
132	0490	1	01	007	1	1	1	0300	000	0700	6	1	0200	0000
132	0490	1	01	008	1	2	1	0620	001	1000	6	1	0000	0000
132	0490	1	01	009	1	1	1	0700	070	0700	6	1	0400	0000
132	0490	1	01	010	1	1	1	0000	000	1000	6	1	0400	0000
132	0490	1	01	011	1	1	1	0000	000	1000	6	1	0400	0000
132	0490	1	01	012	1	1	1	1000	110	1000	7	1	0000	0000
132	0490	1	01	013	1	1	1	0400	000	0000	6	1	0400	0000
132	0490	1	01	014	1	1	1	0100	100	0000	6	1	1000	0000
132	0490	1	01	015	1	1	1	0000	140	1000	6	1	0000	0000
132	0490	1	01	016	1	1	1	0000	140	0000	6	1	0000	0000
132	0490	1	01	017	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	018	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	019	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	020	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	021	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	022	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	023	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	024	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	025	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	026	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	027	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	028	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	029	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	030	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	031	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	032	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	033	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	034	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	035	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	036	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	037	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	038	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	039	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	040	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	041	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	042	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	043	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	044	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	045	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	046	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	047	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	048	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	049	1	1	1	0000	100	0000	6	1	0000	0000
132	0490	1	01	050	1	1	1	0000	100	0000	6	1	0000	0000

DATA SHEET 2													
C	S	D	S	I	L	D	D	A	M	C	G	ON	OR
U	T	A	N	T	I	A	10	Z	I	T	R	M	OR
N	T	P	E	N	M	T	9M	I	I	C	D	M	OR
Y	O	A	L	M	O	A	TT	N	U	L	P	A	OR
Y	O	P	O	O	O	N	N	M	T	O	M	A	OR
132	0490	1	01	011	2	2	2	0210	047	1	0	0	0
132	0490	1	01	031	2	2	2	0210	210	1	0	0	0
132	0490	1	01	006	2	2	2	0210	227	1	0	0	0
132	0490	1	01	001	2	2	2	0200	010	1	0	0	0
132	0490	1	01	000	2	2	2	0620	001	1	0	0	0

CONNECTS

[illegible]

CHANGTHANOMI RUBBER PLANTATION CO. LTD. THAILAND
 NEW DATA COLLECTION POINT TABLE, 1 FOR 00
 CHANGTHANOMI RUBBER LAY IN NEW 00 NEW 00
 AND NEW 00 NEW 00. CHANGTHANOMI, 00000 1000000. 000 000 0000 00000

[illegible]

CHARTWELL, SUREEN AND PICHAPPA PLANTATION SITE, THAILAND
 FOR DATA COLLECTION POINT 00000, 0 AND 00
 000000000000 0000 0000 0000 0000 0000 0000 0000 0000 0000
 AND 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000

(Continued)

Table B10 (Continued)

DATA SHEET 2															COMMENTS
Q	Q	Q	S	I	L	L	D	D	A	SP	S	C	RT	HABIT	
U	T	A	R	T	L	L	A	A	Z	T	S	T	T		
N	S	A	L	M	M	M	T	S	M	R	S	S	T		
T	N	G	N	N	N	S	F	R	U	S	S	S	T	N	S
V	O	P	O	O	O	M	R	M	M	M	S	S	E	P	R
102	0039	1	61	002	2	2	2	6100	000	0	1	0	0		
102	0039	1	61	003	2	2	2	0900	003	0	1	0	0		
102	0039	1	61	004	2	2	2			0	1	0	0		
102	0039	1	61	005	2	2	2	1400	012	0	1	0	0		
102	0039	1	61	006	2	2	2	1170	032	0	1	0	0		
102	0039	1	61	007	2	2	2	0700	030	0	1	0	0		
102	0039	1	61	008	2	2	2	0700	030	0	1	0	0		
102	0039	1	61	009	2	2	2	0030	000	0	1	0	0		
102	0039	1	61	010	2	2	2	0900	072	0	1	0	0		
102	0039	1	61	011	2	2	2	0020	079	0	1	0	0		
102	0039	1	61	012	2	2	2	1200	076	0	1	0	0		
102	0039	1	61	013	2	2	2	1170	100	0	1	0	0		
102	0039	1	61	014	2	2	2	1100	106	0	1	0	0		
102	0039	1	61	015	2	2	2	1000	109	0	1	0	0		
102	0039	1	61	016	2	2	2	0790	117	0	1	0	0		
102	0039	1	61	017	2	2	2	1100	129	0	1	0	0		
102	0039	1	61	018	2	2	2	0240	120	0	1	0	0		
102	0039	1	61	019	2	2	2	0600	139	0	1	0	0		
102	0039	1	61	020	2	2	2	1400	144	0	1	0	0		
102	0039	1	61	021	2	2	2	0800	151	0	1	0	0		
102	0039	1	61	022	2	2	2	1900	150	0	1	0	0		
102	0039	1	61	023	2	2	2	1300	192	0	1	0	0		
102	0039	1	61	024	2	2	2	0900	103	0	1	0	0		
102	0039	1	61	025	2	2	2	1290	100	0	1	0	0		
102	0039	1	61	026	2	2	2	170	104	0	1	0	0		
102	0039	1	61	027	2	2	2	1430	190	0	1	0	0		
102	0039	1	61	028	2	2	2	1220	210	0	1	0	0		
102	0039	1	61	029	2	2	2	0730	216	0	1	0	0		
102	0039	1	61	030	2	2	2	0220	235	0	1	0	0		
102	0039	1	61	031	2	2	2	1400	222	0	1	0	0		
102	0039	1	61	032	2	2	2	1260	275	0	1	0	0		
102	0039	1	61	033	2	2	2	1020	234	0	1	0	0		
102	0039	1	61	034	2	2	2	0700	244	0	1	0	0		
102	0039	1	61	035	2	2	2	1200	254	0	1	0	0		
102	0039	1	61	037	2	2	2	0800	264	0	1	0	0		
102	0039	1	61	038	2	2	2	1120	275	0	1	0	0		
102	0039	1	61	039	2	2	2	0400	279	0	1	0	0		
102	0039	1	61	040	2	2	2	0700	282	0	1	0	0		
102	0039	1	61	041	2	2	2	1100	292	0	1	0	0		
102	0039	1	61	042	2	2	2	1100	304	0	1	0	0		
102	0039	1	61	043	2	2	2	0900	334	0	1	0	0		
102	0039	1	61	044	2	2	2	0900	344	0	1	0	0		
102	0039	1	61	045	2	2	2	1300	346	0	1	0	0		
102	0039	1	61	046	2	2	2	0700	392	0	1	0	0		
102	0039	1	61	047	2	2	2	0290	022	0	1	0	0		
102	0039	1	61	048	2	2	2	0790	021	0	1	0	0		
102	0039	1	61	049	2	2	2	1310	022	0	1	0	0		
102	0039	1	61	050	2	2	2	1200	044	0	1	0	0		

Vegetation Structure Data, Data Collection Point 7040

PHANTHONG; FOREST SITE, THAILAND
USO DATA COLLECTION POINT 00440, 9 MAR 65
GEOGRAPHIC COORD LAY 12 DEG 44 MIN 20 SEC N, 102 DEG 00 MIN 00 SEC E
AND MAG NO. 0440 III, AMPHON NAKHAN, DEALS 1/90.00, "II" 0010 0000 034100

(Cont. Listed)

Table B11 (Continued)[illegible]

DATA SHEET 2

COUNT	SITE	DATA	SAMPL	ITEN	LINER	LINES	DATAS	CENTR	AZIMUTH	SPTR	SLS	CTY	STG	RT	MAGN
RY	NONE	GPO	NONE	NONE	NONE		SM	FRA	TH	NN	NN	EDS	ORGE	TYPG	NT

COMMENTS

132	0440	1	01	046	2	2	2	0200	254	1	0	0	0
132	0440	1	01	060	2	2	2	0100	121	0	1	0	0
132	0440	1	01	070	2	2	2	0250	177	0	1	0	0

Table B12

Plant Height and Stem Spacing at MES Data Collection Point P3-01

MES DATA COLLECTION POINT P3-01, PINA FOREST SITE, PANAMA CANAL ZONE
 GEOGRAPHIC COORD LAT 99 DEG 12 MIN 30 SEC N, LONG 79 DEG 59 MIN 02 SEC W
 EXPANDED AREA = 1297. SQUARE METERS

PLANT HEIGHT (m)	NUMBER OF STEMS IN EACH HEIGHT CLASS										PLANT HEIGHT	TOTAL NUMBER OF STEMS				SPACING OF STEMS (cm)			
	1	2	3	4	5	6	7	8	9	10		OF GIVEN MT. LESS	OF GIVEN MT. AND GREATER	OF GIVEN MT. AND LESS (omit MT. 0.11	OF GIVEN MT. AND LESS (omit MT. 0.11	OF GIVEN MT. AND LESS	OF GIVEN MT. AND GREATER	OF GIVEN MT. AND LESS (omit MT. 0.11	OF GIVEN MT. AND LESS (omit MT. 0.11
0	0.	0.	1472.	0.	0.	0.	0.	0.	0.	0.	0.	10072.	11004.	0.	0.	30.	37.	0.	0.
1	0.	0.	0.	720.	0.	0.	0.	0.	0.	0.	0.	10072.	11004.	0.	0.	140.	37.	110.	0.
2	0.	0.	0.	0.	100.	0.	0.	0.	0.	0.	0.	11004.	11004.	160.	160.	310.	37.	105.	310.
3	0.	0.	0.	0.	50.	0.	0.	0.	0.	0.	0.	11004.	11004.	210.	210.	330.	37.	220.	272.
4	0.	0.	0.	0.	52.	0.	0.	0.	0.	0.	0.	11004.	11004.	240.	240.	350.	37.	251.	244.
5	0.	0.	0.	0.	0.	14.	0.	0.	0.	0.	0.	11074.	11074.	282.	282.	390.	37.	282.	230.
6	0.	0.	0.	0.	0.	22.	0.	0.	0.	0.	0.	11096.	11096.	304.	304.	410.	37.	303.	229.
7	0.	0.	0.	0.	0.	11.	0.	0.	0.	0.	0.	11207.	11207.	319.	319.	430.	37.	311.	229.
8	0.	0.	0.	0.	0.	47.	0.	0.	0.	0.	0.	11207.	11207.	342.	342.	450.	37.	332.	210.
9	0.	0.	0.	0.	0.	31.	0.	0.	0.	0.	0.	11207.	11207.	365.	365.	470.	37.	357.	202.
10	0.	0.	0.	0.	0.	11.	0.	0.	0.	0.	0.	11207.	11207.	388.	388.	490.	37.	380.	190.
11	0.	0.	0.	0.	0.	11.	0.	0.	0.	0.	0.	11207.	11207.	411.	411.	510.	37.	404.	190.
12	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	434.	434.	530.	37.	428.	163.
13	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	457.	457.	550.	37.	452.	163.
14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	480.	480.	570.	37.	476.	163.
15	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	503.	503.	590.	37.	500.	163.
16	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	526.	526.	610.	37.	524.	163.
17	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	549.	549.	630.	37.	548.	163.
18	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	572.	572.	650.	37.	572.	163.
19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	595.	595.	670.	37.	596.	163.
20	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	618.	618.	690.	37.	620.	163.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	641.	641.	710.	37.	644.	163.
22	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	664.	664.	730.	37.	668.	163.
23	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	687.	687.	750.	37.	692.	163.
24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	710.	710.	770.	37.	716.	163.
25	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	733.	733.	790.	37.	740.	163.
26	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	756.	756.	810.	37.	764.	163.
27	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	779.	779.	830.	37.	788.	163.
28	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	802.	802.	850.	37.	812.	163.
29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	825.	825.	870.	37.	836.	163.
30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	848.	848.	890.	37.	860.	163.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	871.	871.	910.	37.	884.	163.
32	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11207.	11207.	894.	894.	930.	37.	908.	163.

(Cont. Table)

Table 11.2 (Continued)

STEM DIAMETER	NUMBER OF STEMS IN EACH HEIGHT CLASS										TOTAL NUMBER OF STEMS	SPACING OF STEMS (cm)		
	1	2	3	4	5	6	7	8	OF GIVEN DIAM AND LESS	OF GIVEN DIAM AND GREATER				
1	6	920	1472	650	60	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
2	6	0	0	40	124	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
3	6	0	0	0	38	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
4	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
5	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
6	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
7	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
8	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
9	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
10	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
11	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
12	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
13	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
14	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
15	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
16	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
17	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
18	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
19	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
20	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
21	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
22	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
23	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
24	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
25	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
26	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
27	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
28	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
29	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
30	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
31	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
32	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
33	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
34	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
35	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
36	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
37	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
38	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
39	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
40	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
41	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
42	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
43	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
44	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
45	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
46	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
47	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
48	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
49	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
50	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
51	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
52	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
53	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
54	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
55	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
56	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
57	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
58	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER
59	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND LESS (cm)
60	6	0	0	0	32	0	0	0	11340	11060	0	30	37	OF GIVEN DIAM AND GREATER

Table B13

Plant Height and Stem Spacing at MBS Data Collection Point P3-02

MBS DATA COLLECTION POINT P3-02, PINA FOREST SITE, PANAMA CANAL ZONE
 GEOGRAPHIC COORD LAT 09 DEG 12 MIN 37 SEC N, LONG 079 DEG 50 MIN 47 SEC W
 EXPANDED AREA = 1257. SQUARE METERS

EXPANDED AREA 1										125% SOUTHERN METERS									
PLANT WEIGHT										SPACING OF STEMS (CM)									
TOTAL NUMBER OF STEMS										SPACING OF STEMS (CM)									
PLANT HEIGHT (M)	1	2	3	4	5	6	7	8	OF GIVEN MT.	OF GIVEN MT. AND LESS	OF GIVEN MT. AND GREATER	OF GIVEN MT. AND LESS (ONLY MT. 0.1)	OF GIVEN MT. AND GREATER	OF GIVEN MT. AND LESS (ONLY MT. 0.1)	OF GIVEN MT. AND GREATER	OF GIVEN MT. AND LESS (ONLY MT. 0.1)			
0	0	250	250	0	0	0	0	0	2750	3756	5402	0	76	54	0	0			
1	0	0	0	2133	0	0	0	0	2133	4009	2086	3	207	57	77	0			
2	0	0	0	0	224	0	0	0	224	5113	953	224	207	56	170	267			
3	0	0	0	0	64	0	0	0	64	5177	329	308	207	56	221	234			
4	0	0	0	0	0	0	0	0	0	5257	245	308	207	55	244	209			
5	0	0	0	0	0	12	0	0	12	5278	105	301	207	55	294	209			
6	0	0	0	0	0	0	0	0	0	5283	172	394	207	55	294	209			
7	0	0	0	0	0	12	0	0	12	5296	150	407	207	55	317	190			
8	0	0	0	0	0	37	0	0	37	5334	146	445	207	55	331	190			
9	0	0	0	0	0	0	0	0	0	5372	188	483	207	55	305	182			
10	0	0	0	0	0	12	0	0	12	5385	73	494	207	55	476	189			
11	0	0	0	0	0	12	0	0	12	5398	57	509	207	55	538	177			
12	0	0	0	0	0	0	0	0	0	5402	44	509	207	55	683	177			
13	0	0	0	0	0	0	2	0	2	5404	48	513	207	55	683	177			
14	0	0	0	0	0	0	0	0	0	5418	38	515	207	55	683	177			
15	0	0	0	0	0	0	0	0	0	5418	32	525	207	55	787	175			
16	0	0	0	0	0	0	0	0	0	5414	28	525	207	55	787	175			
17	0	0	0	0	0	0	0	0	0	5414	28	525	207	55	787	175			
18	0	0	0	0	0	0	0	0	0	5416	26	525	207	55	787	175			
19	0	0	0	0	0	0	16	0	16	5432	10	543	207	55	787	175			
20	0	0	0	0	0	0	0	0	0	5432	10	543	207	55	787	175			
21	0	0	0	0	0	0	0	0	0	5432	10	543	207	55	787	175			
22	0	0	0	0	0	0	0	0	0	5432	10	543	207	55	787	175			
23	0	0	0	0	0	0	0	0	0	5432	10	543	207	55	787	175			
24	0	0	0	0	0	0	0	0	0	5432	10	543	207	55	787	175			
25	0	0	0	0	0	0	0	0	0	5438	4	549	207	55	787	175			
26	0	0	0	0	0	0	0	0	0	5438	4	549	207	55	787	175			
27	0	0	0	0	0	0	0	0	0	5438	4	549	207	55	787	175			
28	0	0	0	0	0	0	0	0	0	5438	4	549	207	55	787	175			
29	0	0	0	0	0	0	0	0	0	5438	4	549	207	55	787	175			
30	0	0	0	0	0	0	0	0	0	5438	4	549	207	55	787	175			
31	0	0	0	0	0	0	0	0	0	5438	4	549	207	55	787	175			
32	0	0	0	0	0	0	0	0	0	5438	4	549	207	55	787	175			
33	0	0	0	0	0	0	0	0	0	5438	4	549	207	55	787	175			

(Continued)

Table 213 (Continued)

[illegible]

Table 21a

Plant Height and Stem Spacing of MES Data Collection Point P3-03

MES DATA COLLECTION POINT P3-03, PINA FOREST SITE, PANAMA CANAL ZONE
 GEOGRAPHIC COORD LAY 00 DEG 12 MIN 46 SEC N, 079 DEG 50 MIN 50 SEC W
 EXPANDED AREA 0.1597 SQUARE METERS

PLANT HEIGHT (m)	NUMBER OF STEMS IN EACH HEIGHT CLASS										TOTAL NUMBER OF STEMS				SPACING OF STEMS (cm)			
	1	2	3	4	5	6	7	8	OF GIVEN MT.	OF GIVEN MT. AND LESS	OF GIVEN MT. AND GREATER	OF GIVEN MT. AND LESS (0.1)	OF GIVEN MT. AND LESS (0.1)	OF GIVEN MT.	OF GIVEN MT. AND LESS	OF GIVEN MT. AND GREATER	OF GIVEN MT. AND LESS (0.1)	OF GIVEN MT. AND LESS (0.1)
0	0	230	400	1375	0	0	0	0	2700	2700	4330	0	0	2700	77	60	0	0
1	0	0	0	0	0	0	0	0	1375	4375	1750	0	0	1375	100	00	0	0
2	0	0	0	0	0	0	0	0	00	4100	200	0	0	400	02	211	400	400
3	0	0	0	0	0	0	0	0	00	4220	290	147	0	400	02	232	330	330
4	0	0	0	0	0	0	0	0	00	4340	134	220	0	400	01	273	304	304
5	0	0	0	0	0	0	0	0	00	4320	132	247	0	400	01	300	295	295
6	0	0	0	0	0	0	0	0	00	4320	114	291	0	2000	01	379	292	292
7	0	0	0	0	0	0	0	0	00	4340	110	260	0	900	01	301	244	244
8	0	0	0	0	0	0	0	0	00	4300	92	273	0	2000	01	301	244	244
9	0	0	0	0	0	0	0	0	00	4370	00	262	0	1330	01	417	242	242
10	0	0	0	0	0	0	0	0	13	4370	70	209	0	1100	01	400	230	230
11	0	0	0	0	0	0	0	0	13	4303	64	200	0	1100	00	402	220	220
12	0	0	0	0	0	0	0	0	13	4300	53	200	0	1100	00	402	220	220
13	0	0	0	0	0	0	0	0	9	4001	40	230	0	1700	00	432	202	202
14	0	0	0	0	0	0	0	0	7	4000	39	232	0	1510	00	432	210	210
15	0	0	0	0	0	0	0	0	7	4013	20	340	0	1510	00	432	210	210
16	0	0	0	0	0	0	0	0	9	4020	10	300	0	1700	00	432	210	210
17	0	0	0	0	0	0	0	0	0	4020	10	300	0	1700	00	432	210	210
18	0	0	0	0	0	0	0	0	0	4022	10	307	0	2020	00	1000	210	210
19	0	0	0	0	0	0	0	0	0	4022	10	307	0	2020	00	1000	210	210
20	0	0	0	0	0	0	0	0	0	4024	14	340	0	2020	00	1000	214	214
21	0	0	0	0	0	0	0	0	0	4024	12	340	0	2020	00	1190	214	214
22	0	0	0	0	0	0	0	0	0	4026	10	391	0	2020	00	1190	214	214
23	0	0	0	0	0	0	0	0	0	4020	10	340	0	2020	00	1000	213	213
24	0	0	0	0	0	0	0	0	0	4020	0	350	0	2020	00	1000	212	212
25	0	0	0	0	0	0	0	0	0	4020	0	350	0	2020	00	1000	212	212
26	0	0	0	0	0	0	0	0	0	4020	0	350	0	2020	00	1000	212	212
27	0	0	0	0	0	0	0	0	0	4020	0	350	0	2020	00	1000	212	212
28	0	0	0	0	0	0	0	0	0	4020	0	350	0	2020	00	1000	212	212
29	0	0	0	0	0	0	0	0	0	4020	0	350	0	2020	00	1000	212	212
30	0	0	0	0	0	0	0	0	0	4020	0	350	0	2020	00	1000	212	212
31	0	0	0	0	0	0	0	0	0	4020	0	350	0	2020	00	1000	212	212
32	0	0	0	0	0	0	0	0	0	4020	0	350	0	2020	00	1000	212	212
33	0	0	0	0	0	0	0	0	0	4020	0	350	0	2020	00	1000	212	212

(Continued)

Table B1k (Continued)

STEM DIAM (cm)	NUMBER OF STEPS IN EACH WEIGHT CLASS										TOTAL NUMBER OF STEPS		SPACING OF STEPS (cm)	
	1	2	3	4	5	6	7	8	OF GIVEN DIAM LESS	OF GIVEN DIAM AND LESS (ONLY GREATER DIAM 1.2)	OF GIVEN DIAM AND LESS (ONLY GREATER DIAM 1.2)	OF GIVEN DIAM LESS	OF GIVEN DIAM AND LESS (ONLY GREATER DIAM 1.2)	OF GIVEN DIAM AND LESS (ONLY GREATER DIAM 1.2)
1	0	230	460	700	0	0	0	0	3400	3400	3400	0	0	0
2	0	0	0	0	0	0	0	0	710	4140	4140	0	0	0
3	0	0	0	0	0	0	0	0	131	4271	4271	0	0	0
4	0	0	0	0	0	0	0	0	46	4317	4317	0	0	0
5	0	0	0	0	0	0	0	0	26	4353	4353	0	0	0
6	0	0	0	0	0	0	0	0	0	4392	4392	0	0	0
7	0	0	0	0	0	0	0	0	0	4392	4392	0	0	0
8	0	0	0	0	0	0	0	0	13	4392	4392	0	0	0
9	0	0	0	0	0	0	0	0	0	4374	4374	0	0	0
10	0	0	0	0	0	0	0	0	0	4368	4368	0	0	0
11	0	0	0	0	0	0	0	0	0	4368	4368	0	0	0
12	0	0	0	0	0	0	0	0	0	4368	4368	0	0	0
13	0	0	0	0	0	0	0	0	0	4361	4361	0	0	0
14	0	0	0	0	0	0	0	0	11	4402	4402	0	0	0
15	0	0	0	0	0	0	0	0	0	4407	4407	0	0	0
16	0	0	0	0	0	0	0	0	0	4407	4407	0	0	0
17	0	0	0	0	0	0	0	0	0	4411	4411	0	0	0
18	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
19	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
20	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
21	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
22	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
23	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
24	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
25	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
26	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
27	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
28	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
29	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
30	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
31	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
32	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
33	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
34	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
35	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
36	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
37	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
38	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
39	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
40	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
41	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
42	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
43	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
44	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
45	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
46	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
47	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
48	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
49	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
50	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
51	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
52	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
53	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
54	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
55	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
56	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
57	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0
58	0	0	0	0	0	0	0	0	0	4413	4413	0	0	0

Table B15

Plant Height and Stem Spacing at WES Data Collection Point P3-04

WES DATA COLLECTION POINT P3-04, PINA FOREST SITE, PANAMA CANAL ZONE
 GEOGRAPHIC COORD LAY 09 DEG 12 MIN 33 SEC N, LONG 79 DEG 59 MIN 10 SEC W
 EXPANDED AREA 8 1297. SQUARE METERS

PLANT HEIGHT (m)	NUMBER OF STEMS IN EACH HEIGHT CLASS										PLANT HEIGHT	TOTAL NUMBER OF STEMS				SPACING OF STEMS (cm)			
	1	2	3	4	5	6	7	8	OF GIVEN MT.	OF GIVEN MT. AND LESS GREATER		OF GIVEN MT. AND LESS GREATER	OF GIVEN MT. AND LESS GREATER	OF GIVEN MT. AND LESS GREATER	OF GIVEN MT. AND LESS GREATER	OF GIVEN MT. AND LESS	OF GIVEN MT. AND GREATER	OF GIVEN MT. AND LESS (ONLY MT. 0.1)	OF GIVEN MT. AND LESS (ONLY MT. 0.1)
0	2500.	2300.	550.	0.	0.	0.	0.	0.	3350.	5350.	0.	0.	0.	0.	0.	59.	41.	0.	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	2824.	7974.	0.	0.	0.	0.	0.	49.	61.	0.	0.
2	0.	0.	0.	0.	1248.	0.	0.	0.	1940.	9214.	0.	0.	0.	0.	0.	42.	99.	0.	0.
3	0.	0.	0.	0.	169.	0.	0.	0.	169.	9379.	0.	0.	0.	0.	0.	41.	209.	0.	0.
4	0.	0.	0.	0.	62.	0.	0.	0.	0.	9441.	0.	0.	0.	0.	0.	41.	209.	0.	0.
5	0.	0.	0.	0.	0.	0.	0.	0.	44.	9489.	0.	0.	0.	0.	0.	41.	310.	0.	0.
6	0.	0.	0.	0.	0.	0.	0.	0.	44.	9489.	0.	0.	0.	0.	0.	41.	310.	0.	0.
7	0.	0.	0.	0.	0.	0.	0.	0.	10.	9335.	0.	0.	0.	0.	0.	41.	302.	0.	0.
8	0.	0.	0.	0.	0.	0.	0.	0.	10.	9335.	0.	0.	0.	0.	0.	41.	402.	0.	0.
9	0.	0.	0.	0.	0.	0.	0.	0.	10.	9335.	0.	0.	0.	0.	0.	41.	471.	0.	0.
10	0.	0.	0.	0.	0.	0.	0.	0.	10.	9335.	0.	0.	0.	0.	0.	41.	508.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	5.	9545.	0.	0.	0.	0.	0.	41.	558.	0.	0.
12	0.	0.	0.	0.	0.	0.	0.	0.	5.	9545.	0.	0.	0.	0.	0.	41.	558.	0.	0.
13	0.	0.	0.	0.	0.	0.	0.	0.	15.	9375.	0.	0.	0.	0.	0.	41.	783.	0.	0.
14	0.	0.	0.	0.	0.	0.	0.	0.	2.	9841.	0.	0.	0.	0.	0.	41.	783.	0.	0.
15	0.	0.	0.	0.	0.	0.	0.	0.	2.	9841.	0.	0.	0.	0.	0.	41.	783.	0.	0.
16	0.	0.	0.	0.	0.	0.	0.	0.	9.	9598.	0.	0.	0.	0.	0.	41.	783.	0.	0.
17	0.	0.	0.	0.	0.	0.	0.	0.	4.	9598.	0.	0.	0.	0.	0.	41.	783.	0.	0.
18	0.	0.	0.	0.	0.	0.	0.	0.	2.	9598.	0.	0.	0.	0.	0.	41.	783.	0.	0.
19	0.	0.	0.	0.	0.	0.	0.	0.	2.	9598.	0.	0.	0.	0.	0.	41.	783.	0.	0.
20	0.	0.	0.	0.	0.	0.	0.	0.	0.	9598.	0.	0.	0.	0.	0.	41.	783.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	9.	9598.	0.	0.	0.	0.	0.	41.	783.	0.	0.
22	0.	0.	0.	0.	0.	0.	0.	0.	0.	9598.	0.	0.	0.	0.	0.	41.	783.	0.	0.
23	0.	0.	0.	0.	0.	0.	0.	0.	0.	9598.	0.	0.	0.	0.	0.	41.	783.	0.	0.
24	0.	0.	0.	0.	0.	0.	0.	0.	0.	9598.	0.	0.	0.	0.	0.	41.	783.	0.	0.
25	0.	0.	0.	0.	0.	0.	0.	0.	4.	9681.	0.	0.	0.	0.	0.	41.	783.	0.	0.
26	0.	0.	0.	0.	0.	0.	0.	0.	2.	9681.	0.	0.	0.	0.	0.	41.	783.	0.	0.
27	0.	0.	0.	0.	0.	0.	0.	0.	2.	9681.	0.	0.	0.	0.	0.	41.	783.	0.	0.
28	0.	0.	0.	0.	0.	0.	0.	0.	0.	9681.	0.	0.	0.	0.	0.	41.	783.	0.	0.
29	0.	0.	0.	0.	0.	0.	0.	0.	0.	9681.	0.	0.	0.	0.	0.	41.	783.	0.	0.
30	0.	0.	0.	0.	0.	0.	0.	0.	2.	9681.	0.	0.	0.	0.	0.	41.	783.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	9681.	0.	0.	0.	0.	0.	41.	783.	0.	0.
32	0.	0.	0.	0.	0.	0.	0.	0.	0.	9681.	0.	0.	0.	0.	0.	41.	783.	0.	0.
33	0.	0.	0.	0.	0.	0.	0.	0.	0.	9681.	0.	0.	0.	0.	0.	41.	783.	0.	0.

(Continued)

STERN DIARIES

STEM DIAM (CM)	NUMBER OF STEMS IN EACH HEIGHT CLASS										TOTAL NUMBER OF STEMS	OF GIVEN DIAM AND LENGTH LESS ONE CM	OF GIVEN DIAM AND LENGTH LESS ONE CM	OF GIVEN DIAM AND LENGTH LESS ONE CM	OF GIVEN DIAM AND LENGTH LESS ONE CM	OF GIVEN DIAM AND LENGTH LESS ONE CM
	1	2	3	4	5	6	7	8	9							
1	2500										49	41	0	0	0	0
2		2000									190	104	0	0	0	0
3			990								100	300	0	0	0	0
4				1340	1090						100	300	0	0	0	0
5					1270						100	300	0	0	0	0
6					210						100	300	0	0	0	0
7											100	300	0	0	0	0
8											100	300	0	0	0	0
9											100	300	0	0	0	0
10											100	300	0	0	0	0
11											100	300	0	0	0	0
12											100	300	0	0	0	0
13											100	300	0	0	0	0
14											100	300	0	0	0	0
15											100	300	0	0	0	0
16											100	300	0	0	0	0
17											100	300	0	0	0	0
18											100	300	0	0	0	0
19											100	300	0	0	0	0
20											100	300	0	0	0	0
21											100	300	0	0	0	0
22											100	300	0	0	0	0
23											100	300	0	0	0	0
24											100	300	0	0	0	0
25											100	300	0	0	0	0
26											100	300	0	0	0	0
27											100	300	0	0	0	0
28											100	300	0	0	0	0
29											100	300	0	0	0	0
30											100	300	0	0	0	0
31											100	300	0	0	0	0
32											100	300	0	0	0	0
33											100	300	0	0	0	0
34											100	300	0	0	0	0
35											100	300	0	0	0	0
36											100	300	0	0	0	0
37											100	300	0	0	0	0
38											100	300	0	0	0	0
39											100	300	0	0	0	0
40											100	300	0	0	0	0
41											100	300	0	0	0	0
42											100	300	0	0	0	0
43											100	300	0	0	0	0
44											100	300	0	0	0	0
45											100	300	0	0	0	0
46											100	300	0	0	0	0
47											100	300	0	0	0	0
48											100	300	0	0	0	0
49											100	300	0	0	0	0
50											100	300	0	0	0	0
51											100	300	0	0	0	0
52											100	300	0	0	0	0
53											100	300	0	0	0	0
54											100	300	0	0	0	0
55											100	300	0	0	0	0
56											100	300	0	0	0	0
57											100	300	0	0	0	0
58											100	300	0	0	0	0

Table B16

Plant Height and Stem Spacing at WES Data Collection Point P4-01

WES DATA COLLECTION POINT P4-01, BALDIA FOREST SITE, PANAMA CANAL ZONE
 GEOGRAPHIC COORD LAY 10 DEG 04 MIN 17 SEC N LONG 879 DEG 44 MIN 22 SEC W
 EXPANDED AREA = 1257. SQUARE METERS

PLANT HEIGHT (M)	NUMBER OF STEMS IN EACH HEIGHT CLASS										PLANT HEIGHT (M)
	1	2	3	4	5	6	7	8	OF GIVEN MT. AND LESS	OF GIVEN MT. AND GREATER	
0	0	978	979	0	0	0	0	0	1953	5668	0
1	0	0	0	3244	0	0	0	0	4797	4187	0
2	0	0	0	0	246	0	0	0	5803	863	0
3	0	0	0	0	348	0	0	0	5303	617	0
4	0	0	0	0	97	0	0	0	5408	277	0
5	0	0	0	0	0	23	0	0	5453	228	0
6	0	0	0	0	0	53	0	0	5516	197	0
7	0	0	0	0	0	38	0	0	5546	144	0
8	0	0	0	0	0	30	0	0	5576	114	0
9	0	0	0	0	0	0	0	0	5594	84	0
10	0	0	0	0	0	23	0	0	5599	84	0
11	0	0	0	0	0	0	0	0	5599	61	0
12	0	0	0	0	0	0	0	0	5599	61	0
13	0	0	0	0	0	0	0	0	5599	61	0
14	0	0	0	0	0	0	0	0	5599	61	0
15	0	0	0	0	0	0	0	0	5599	61	0
16	0	0	0	0	0	0	0	0	5599	61	0
17	0	0	0	0	0	0	0	0	5599	61	0
18	0	0	0	0	0	0	0	0	5599	61	0
19	0	0	0	0	0	0	0	0	5599	61	0
20	0	0	0	0	0	0	0	0	5599	61	0
21	0	0	0	0	0	0	0	0	5599	61	0
22	0	0	0	0	0	0	0	0	5599	61	0
23	0	0	0	0	0	0	0	0	5599	61	0
24	0	0	0	0	0	0	0	0	5599	61	0
25	0	0	0	0	0	0	0	0	5599	61	0

(Cont. issued)

Table 7.16 (Continued)

[illegible]

Table B17

Plant Height and Stem Spacing at WES Data Collection Point P4-06

WES DATA COLLECTION POINT P4-06, BALBOA FOREST SITE, PANAMA CANAL ZONE
 GEOGRAPHIC COORD LAY 00 DEG 04 MIN 10 SEC N, LONG 079 DEG 44 MIN 23 SEC W
 EXPANDED AREA 0 1257. SQUARE METERS

PLANT HEIGHT (M)	NUMBER OF STEMS IN EACH HEIGHT CLASS										PLANT HEIGHT (M)
	1	2	3	4	5	6	7	8	OF GIVEN MT.		
TOTAL NUMBER OF STEMS											
SPACING OF STEMS (CM)											
OF GIVEN MT. AND LESS											
OF GIVEN MT. AND GREATER											
OF GIVEN MT. AND LESS (OMIT MT. 0-11)											
0	0	3911	686	0	0	0	0	0	4997	5678	0
1	0	0	0	417	0	0	0	0	417	1801	0
2	0	0	0	0	173	0	0	0	173	664	173
3	0	0	0	0	110	0	0	0	110	491	283
4	0	0	0	0	94	0	0	0	94	381	433
5	0	0	0	0	0	78	0	0	78	289	499
6	0	0	0	0	0	44	0	0	44	207	633
7	0	0	0	0	0	33	0	0	33	169	942
8	0	0	0	0	0	11	0	0	11	132	944
9	0	0	0	0	0	11	0	0	11	121	944
10	0	0	0	0	0	33	0	0	33	110	947
11	0	0	0	0	0	22	0	0	22	77	953
12	0	0	0	0	0	11	0	0	11	59	958
13	0	0	0	0	0	11	0	0	11	53	963
14	0	0	0	0	0	11	0	0	11	41	963
15	0	0	0	0	0	0	11	0	11	30	962
16	0	0	0	0	0	0	0	11	11	22	958
17	0	0	0	0	0	0	0	0	0	14	958
18	0	0	0	0	0	0	0	0	0	9	958
19	0	0	0	0	0	0	0	0	0	0	958
20	0	0	0	0	0	0	0	0	0	0	958
21	0	0	0	0	0	0	0	0	0	0	958
22	0	0	0	0	0	0	0	0	0	0	958
23	0	0	0	0	0	0	0	0	0	0	958
24	0	0	0	0	0	0	0	0	0	0	958
25	0	0	0	0	0	0	0	0	0	0	958

(Continued)

Table M17 (Continued)

STEM DIAM (CM)	NUMBER OF STEMS IN EACH HEIGHT CLASS										STEM DIAMETER		TOTAL NUMBER OF STEMS		SPACING OF STEMS (CM)	
	1	2	3	4	5	6	7	8	OF GIVEN DIAM	OF GIVEN DIAM AND LESS GREATER	OF GIVEN DIAM AND LESS (UNIT DIAM 1.2)	OF GIVEN DIAM	OF GIVEN DIAM LESS	OF GIVEN DIAM AND LESS (UNIT DIAM 1.2)	OF GIVEN DIAM AND LESS (UNIT DIAM 1.2)	OF GIVEN DIAM AND LESS (UNIT DIAM 1.2)
1	0	3011	686	101	78	0	0	0	4044	4804	5074	0	0	57	58	0
2	0	0	0	0	108	0	0	0	108	5354	508	0	0	57	58	0
3	0	0	0	0	94	11	0	0	109	5159	430	0	0	57	58	0
4	0	0	0	17	14	78	0	0	111	5278	519	0	0	57	58	0
5	0	0	0	0	0	44	0	0	44	5314	484	0	0	57	58	0
6	0	0	0	0	0	33	0	0	241	5355	368	0	0	57	58	0
7	0	0	0	0	0	11	0	0	11	5366	319	0	0	57	58	0
8	0	0	0	0	0	33	0	0	33	5399	188	0	0	57	58	0
9	0	0	0	0	0	11	0	0	16	5415	75	0	0	57	58	0
10	0	0	0	0	0	22	0	0	22	5437	59	0	0	57	58	0
11	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
12	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
13	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
14	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
15	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
16	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
17	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
18	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
19	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
20	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
21	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
22	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
23	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
24	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
25	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
26	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
27	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
28	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
29	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
30	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
31	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
32	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
33	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
34	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
35	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
36	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
37	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
38	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
39	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
40	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
41	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
42	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
43	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
44	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
45	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
46	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
47	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
48	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
49	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
50	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
51	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
52	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
53	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
54	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
55	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
56	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
57	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0
58	0	0	0	0	0	0	0	0	0	5437	37	0	0	57	58	0

Table 210

Plant Height and Stem Spacing of WBS Data Collection Point P-07

WBS DATA COLLECTION POINT P-07, BALDIA FOREST SITE, PANAMA CANAL ZONE
 GEORAPHIC COORD LAY 80 DEG 00 MIN 17 SEC N, LONG 870 DEG 40 MIN 25 SEC W
 EXPANDED AREA 0 1297. SQUARE METERS

PLANT HEIGHT (m)	NUMBER OF STEMS IN EACH HEIGHT CLASS										TOTAL NUMBER OF STEMS				SPACING OF STEMS (cm)			
	0	1	2	3	4	5	6	7	8	9	OF GIVEN WT.	OF GIVEN WT. AND LESS	OF GIVEN WT. AND LESS GREATER	OF GIVEN WT. AND LESS GREATER	OF GIVEN WT. AND LESS	OF GIVEN WT. AND LESS	OF GIVEN WT. AND LESS	OF GIVEN WT. AND LESS
0	2206.	970.	1302.	597.	0.	0.	0.	0.	0.	0.	4489.	4489.	4489.	4489.	0.	0.	0.	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
5	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
6	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
7	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
8	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
10	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
12	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
13	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
15	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
16	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
17	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
18	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
20	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
22	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
23	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
25	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
26	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
27	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.
28	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	997.	997.	997.	997.	104.	104.	104.	104.

(Cont. Table)

(continued) FBI Form

[illegible]

Table 219

Plant Height and Stem Spacing at VES Data Collection Point V0450

VES DATA COLLECTION POINT V0450, PEAN BURI FOREST SITE, THAILAND
 GEOGRAPHIC COORDS LAT 12 DEG 25 MIN 53 SEC N, LONG 99 DEG 46 MIN 23 SEC E
 EXPANDED AREA = 1257. SQUARE METERS

PLANT HEIGHT (m)	NUMBER OF STEMS IN EACH HEIGHT CLASS										PLANT HEIGHT	TOTAL NUMBER OF STEMS				SPACING OF STEMS (cm)			
	1	2	3	4	5	6	7	8	9	10		OF GIVEN MT. LESS	OF GIVEN MT. AND GREATER	OF GIVEN MT. AND LESS (omit MT. 0.1)	OF GIVEN MT. LESS	OF GIVEN MT. AND GREATER	OF GIVEN MT. AND LESS (omit MT. 0.1)	OF GIVEN MT. LESS	OF GIVEN MT. AND GREATER
0	0	0	4132	0	0	0	0	0	0	0	0	4132	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	2998	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	784	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	128	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	7995	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	7991	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0887	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	44	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0883	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0179	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0275	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0275	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0299	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0299	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0303	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0311	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0311	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0315	0	0	0	0	0	0	0

(Cont. Table)

THE CHAIRMAN

[illegible]

Table 200

Plant Height and Stem Spacing at 1950 Data Collection Point 200.1

1950 DATA COLLECTION POINT 200.1, GUATEMALA: CROOKED PLANTATION SITE, TULLAH
 GEOMORPHIC CODED LAT 12 04 30 MIN 30 SEC N. LONG 102 00 10 MIN 32 SEC E
 ELEVATION 2000 M. 1207. SOURCE: 200.1

PLANT HEIGHT (m)	NUMBER OF STEMS IN EACH HEIGHT CLASS										TOTAL NUMBER OF STEMS	SPECIES OF STEMS (cm)				
	1	2	3	4	5	6	7	8	9	10		of given wt. and LDB	of given wt. and LDB	of given wt. and LDB	of given wt. and LDB	of given wt. and LDB
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(Continued)

Table 200 (Continued)

STEM DIAM (CM)	NUMBER OF STEMS IN EACH HEIGHT CLASS							TOTAL NUMBER OF STEMS				SPACING OF STEMS (CM)			
	1	2	3	4	5	6	7	0	OF GIVEN DIAM 40007	OF GIVEN DIAM AND LESS 40007	OF GIVEN DIAM AND LESS (UNIT DIAM 1.2)	OF DIAM 2020	OF GIVEN DIAM AND LESS 10	OF GIVEN DIAM AND LESS (UNIT DIAM 1.2)	OF GIVEN DIAM AND LESS (UNIT DIAM 1.2)
1	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
2	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
3	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
4	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
5	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
6	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
7	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
8	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
9	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
10	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
11	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
12	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
13	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
14	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
15	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
16	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
17	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
18	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
19	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
20	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
21	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
22	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
23	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
24	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
25	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
26	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
27	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
28	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
29	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
30	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
31	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
32	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
33	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
34	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
35	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
36	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
37	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
38	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
39	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
40	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
41	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
42	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
43	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
44	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
45	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
46	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
47	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
48	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
49	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
50	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
51	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0
52	0	0	0	0	0	0	0	0	40007	40007	0	0	10	0	0

[illegible][illegible]

1710 0145170

[illegible]

Table B22

Plant Height and Stem Spacing at WBS Data Collection Point V0640

WBS DATA COLLECTION POINT V0640, CHANTHABURI FOREST SITE, THAILAND
 GEOGRAPHIC COORD LAT 12 DEG 44 MIN 30 SEC N, LONG 102 DEG 05 MIN 08 SEC E
 EXPANDED AREA 6 1257. SQUARE METERS

PLANT HEIGHT (M)	NUMBER OF STEMS IN EACH HEIGHT CLASS										PLANT HEIGHT		TOTAL NUMBER OF STEMS				SPACING OF STEMS (CM)			
	1	2	3	4	5	6	7	8	9	10	OF GIVEN MT.	OF GIVEN MT. AND LESS	OF GIVEN MT. AND GREATER	OF GIVEN MT. AND LESSIONITY MT. 0.1	OF GIVEN MT. AND LESS	OF GIVEN MT. AND GREATER	OF GIVEN MT. AND LESS (ONLY MT. 0.1)			
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1	0	7286	1467	0	0	0	0	0	0	0	0	0	0	0	43	36	0			
2	0	0	0	1022	0	0	0	0	0	0	0	0	0	0	94	69	0			
3	0	0	0	0	1022	0	0	0	0	0	0	0	0	167	37	09	122			
4	0	0	0	0	267	0	0	0	0	0	0	0	0	1334	37	130	110			
5	0	0	0	0	578	0	0	0	0	0	0	0	0	1334	36	133	91			
6	0	0	0	0	0	0	0	0	0	0	0	0	0	144	36	392	91			
7	0	0	0	0	0	17	0	0	0	0	17	12489	104	1337	36	400	91			
8	0	0	0	0	0	0	0	0	0	0	0	12434	79	12434	36	451	91			
9	0	0	0	0	0	11	0	0	0	0	11	12434	71	12434	36	473	91			
10	0	0	0	0	0	0	0	0	0	0	0	12434	68	12434	36	516	91			
11	0	0	0	0	0	14	0	0	0	0	14	12434	92	12434	36	559	91			
12	0	0	0	0	0	0	0	0	0	0	0	12467	38	12467	36	649	91			
13	0	0	0	0	0	3	0	0	0	0	3	12474	38	12474	36	649	91			
14	0	0	0	0	0	4	0	0	0	0	4	12474	49	12474	36	674	91			
15	0	0	0	0	0	9	0	0	0	0	9	12474	31	12474	36	710	91			
16	0	0	0	0	0	1	0	0	0	0	1	12486	24	12486	36	784	91			
17	0	0	0	0	0	3	0	0	0	0	3	12486	25	12486	36	800	91			
18	0	0	0	0	0	2	0	0	0	0	2	12486	22	12486	36	800	91			
19	0	0	0	0	0	3	0	0	0	0	3	12486	28	12486	36	893	91			
20	0	0	0	0	0	3	0	0	0	0	3	12491	17	12491	36	894	91			
21	0	0	0	0	0	2	0	0	0	0	2	12491	14	12491	36	978	91			
22	0	0	0	0	0	7	0	0	0	0	7	12500	12	12500	36	1069	91			
23	0	0	0	0	0	0	0	0	0	0	0	12500	5	12500	36	1193	91			
24	0	0	0	0	0	0	0	0	0	0	0	12500	5	12500	36	1200	91			
25	0	0	0	0	0	0	0	0	0	0	0	12501	5	12501	36	1200	91			
26	0	0	0	0	0	1	0	0	0	0	1	12501	4	12501	36	1200	91			
27	0	0	0	0	0	2	0	0	0	0	2	12501	3	12501	36	1200	91			
28	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			
29	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			
30	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			
31	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			
32	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			
33	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			
34	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			
35	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			
36	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			
37	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			
38	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			
39	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			
40	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			
41	0	0	0	0	0	0	0	0	0	0	0	12504	1	12504	36	1200	91			

(Continued)

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NUMBER OF STOPS IN EACH WEIGHT CLASS

Unclassified

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13. ABSTRACT		
<p>A mission of the Degradation Effects Program (DEP), formerly Joint Environmental Effects Program (JEEP), is to extrapolate estimates of lethality and munition effectiveness in DEP test environments to Southeast Asian environments. If these extrapolations are to be reliable it is imperative that the environmental conditions of the test areas be similar to those of Southeast Asia. Accordingly, objective comparisons must be made of DEP test environments and Southeast Asian environments. This report describes and compares some significant vegetation structural characteristics of two selected DEP sites in the Piña and Balboa forests in the Panama Canal Zone (CZ) and four selected sites in two forests and two rubber plantations in Thailand. The vegetation structural characteristics considered herein include stem diameter, spacing, height, and number. Detailed ground measurements were available from seven data collection points in the CZ and four points in Thailand. Location maps, air and ground photographs, and the personal knowledge of the field survey personnel were used to provide a general description of each site. Site comparisons were made from an analysis of a series of graphs and histograms illustrating the number and cumulative number of stems and spacing and cumulative spacing of stems included in each 1-cm-stem-diameter class and each 1-m-stem-height class. Results revealed the CZ and Thailand forests to be remarkably similar when comparing number of stems in each stem diameter class; however, when comparing spacing of stems in each diameter class and in each height class the forests were somewhat dissimilar. The larger trees in the CZ Piña forest and the two Thailand forests were generally of the same height and were taller than the trees in the CZ Balboa forest. The structural characteristics of the rubber plantations were very unlike those of the forests. The procedures used in sampling vegetation physiognomy are included as Appendix A. Computer print-outs of the vegetation data and results obtained from manipulation of these data are included as Appendix B.</p>		

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